ZERO RELATIVITY

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WGD 2014 Genius of the Year – Asia

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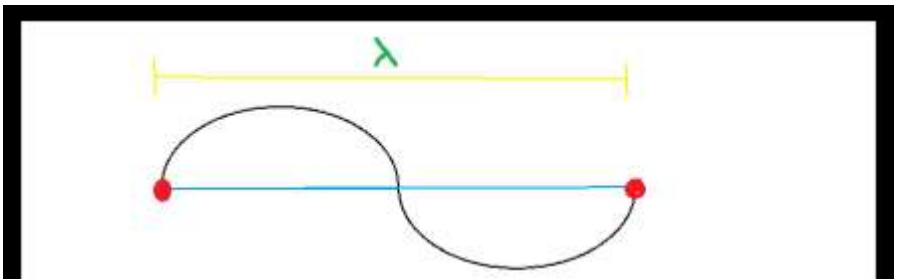
ABSTRACT

Many brilliant mathematicians and scientists, including Galileo Galilei, Johannes Kepler, Nicolaus Copernicus, Gottfried von Leibniz, and Stephen Hawking, have contributed enormously to humankind's knowledge of this incredible universe. In 1687, Sir Isaac Newton published his Philosophiae Naturalis Principia Mathematica to start what is now called classical mechanics in a three-dimensional universe. His mathematical approach was dominant for physicists until, in 1905, Albert Einstein published a paper that included Special Relativity. Suddenly, physicists were using a four-dimensional geometry instead of

a three-dimensional geometry. For more than one hundred years, Albert Einstein's mathematical approach has been dominant for physicists. Einstein's corrections to Newton's geometrical mathematics enabled much better analysis for high-velocity situations. Generations after generations of brilliant, hardworking mathematicians and scientists have given us much more knowledge to be used for human advancement. Following my intellectual predecessors, I have attempted to refine very difficult concepts and equations. I propose that particular adjustments to specific assumptions, concerning light speed as a constant, and concerning reversibility of time, might lead to improvement of our functional, physical geometry to a new "peculiar" geometry. Further, these particular adjustments to specific assumptions might provide new formulation of Maxwell's and Einstein's equations. Alternative formulations are discussed and considered. Topics of vital interest will be addressed and reformulated, including a new derivation for the Navier-Stokes equation and implications for Fluid Dynamics. Please enjoy this introduction to the IRREVERSIBLE and REVERSIBLE theoretic constructs, and the new general "universal conservation" equation from which Navier-Stokes equation may be derived. This paper has major ramifications for Black Hole physics and new mathematics of volume. Most important is the introduction of Entanglement to surprisingly solve the problem associated with different mathematics for macroscopic and microscopic situations. A very interesting fact is that my mathematics of Entanglement leads to understanding of psychic phenomena such as Telepathy and understanding of Reiki therapy.

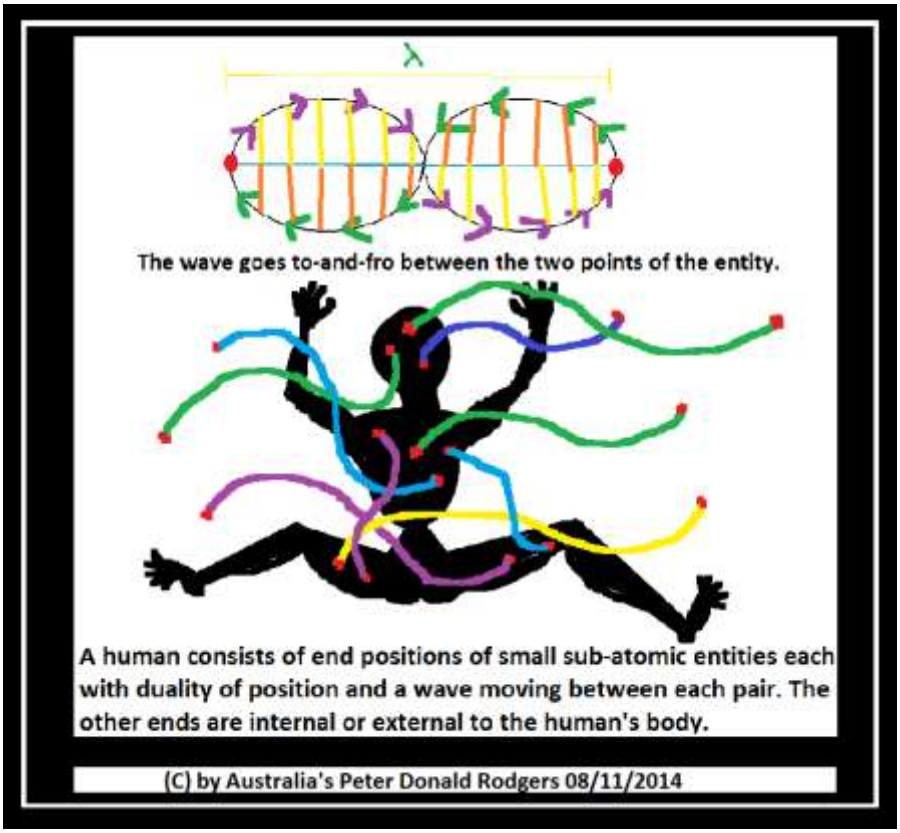
ENTANGLEMENT DIAGRAMS

Recently, I sketched the following diagrams as I attempted to understand what Entanglement is. Those diagrams flashed into my mind as I was attempting to solve an extremely difficult problem to combine macroscopic and microscopic equations. These diagrams will be very relevant later in this paper.



We grew up with the belief that a mass has a single, specific position at any time. But duality of nature, as mass and as wave, has been theorised for such small entities as photons. A wave occurs between two points that are a wave-length apart. I propose that such small entities as photons actually have duality of position.

The two positions of a photon can be far more than ten kilometres apart, but often they are still close. The two-positional photon is an entirety that follows mathematical laws of physics. The human body consists of small entities that often exist in the body and elsewhere for Entanglement.
..... Peter Donald Rodgers, 7/11/2014



REVOLUTION SOLUTIONS

After attempting to unite the important equations of theoretical physics for many years, I was very interested when I saw that Ian Stewart listed 17 equations that changed the world. What Ian Stewart does not know is that I have changed some of the equations he has listed. Is that funny?

… In 530 BC, Pythagoras gave humanity his Pythagoras's Theorem of $a^2 + b^2 = s^2$. Gradually, great thinkers improved this equation until Albert Einstein, in 1905, presented his special relativity concepts with the geometrical mathematics $x_1^2 + x_2^2 + x_3^2 - c^2t^2 = s^2$. Not accepting Einstein's reversibility of events with time, I created an alternative that gives irreversibility of events with time. Who wants time-travel?

… In 1687 AD, Isaac Newton proposed his Law of Gravity, $F = Gm_1m_2/r^2$, but, in 1916, Albert Einstein published his General Theory of Relativity that was very different from Newton's ideas. Not accepting Einstein's Special or General theories of relativity, I combined gravitational aspects with electromagnetic aspects, and further with quantum aspects. Do you prefer those who have given you love or me who has given you quanto-gravito-electro-magnetism?

… In 1746, J. d'Almbert created the wave equation

$[(\delta^2/(\delta x)^2)-(\delta^2/c^2(\delta t)^2)]\psi = 0$. Recently, Klein and Gordon improved that to the Klein-Gordon Equation that is

$[(\sum(\delta^2/(\delta x_j)^2))-(\delta^2/c^2(\delta t)^2)-M^2c^2h^{-2}]\psi = 0$, where $\psi = \sin(x - ct)$. But, from the Klein-Gordon Equation, I created my Klein-Gordon-Rodgers-Reversibility Equation, and have gone much further equationally from there. Will you memorise my wave equations as long lines of advanced Calculus about irreversibility?

… In 1845, C. Navier and G. Stokes published the Navier-Stokes Equation, but I have produced the general equation that shows why the Navier-Stokes Equation exists. Will the physics intelligentsia permanently hide their heads in bullshit?

… In 1905, Einstein gave humanity his $E = mc^2$ equation. By concentrating on momentum rather than energy, I have created more advanced equations.

Further, miraculously, I mathematically proved that Entanglement exists.

This is mathematical evidence that Telepathy and other psychic phenomena happen in this universe's reality.

Ask your favourite can of sardines to solve this problem: Is Peter Donald Rodgers or Albert Einstein the wildest mathematical comedian? I humbly state that Einstein is.

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SPECIAL RELATIVITY

Albert Einstein revolutionised theoretical physics. For about two hundred years, Sir Isaac Newton's physics theory was very popular as it predicted many events. In 1905, after Newtonian physics failures, Albert Einstein proposed revolutionary Special Relativity theory that has been popular for a hundred years. Physics enthusiasts need to compare assumptions and properties of Newton's theory with those of Einstein's SR theory.

NEWTON'S ASSUMPTIONS AND PROPERTIES IN NEWTONIAN PHYSICS:

An infinite number of inertial frames exist. Each inertial frame extends across the universe. Relative uniform motion between two inertial frames always happens. (The assumption of absolute space is unnecessary as revealed by relativistic aspects of mechanics.) All possibilities of inertial frames' relative uniform motions occur. Time is universally the same so that there is absolute time. A Galilean transformation relates any two inertial frames. Newtonian laws, including those for gravity, apply in all inertial frames.

EINSTEIN'S ASSUMPTIONS AND PROPERTIES IN SR PHYSICS:

All observers experience light's velocity in a vacuum as the same constant c that is independent of any light source's motion. The speed of light is the upper limit to the relative velocity between two inertial frames. Each inertial frame has its specific time. Time is not universally the same. A Lorentz transformation relates any two inertial frames. Invariant physics laws apply in all inertial frames. ISOTROPY OF SPACE: An isotropic, electromagnetic medium has permittivity, ε, and permeability, μ, both uniform in all directions of the medium, and most simply in free space. HOMOGENEITY OF SPACE: A homogeneous space has consistent properties at every point, and has no irregularities. INDEPENDENT RODS AND CLOCKS: The measurements of rods and clocks are independent of past measurements. In 1632, Galileo Galilei postulated that no absolute and well-defined state of rest exists. In SR, Einstein applied Galileo's principle of relativity to only inertial reference frames. SPECIAL PRINCIPLE OF RELATIVITY: Any physical laws that apply to a co-ordinate system K also apply to any other co-ordinate system K' moving in uniform translation to K. CONCEPT OF SIMPLICITY: "If you can't explain it to a six year old, you don't understand it yourself." … Einstein.

Special Relativity (SR or STR) is a popular physics theory involving space and time dimensions. SR especially predicts what happens in very-high-velocity situations. Experimental evidence has verified many consequences due to SR: contraction of length, dilation of time, equivalence of mass and energy, relativistic mass, relativity of simultaneity, and an upper limit of universal velocity.

Experimental results from before SR provided evidence for the validity of SR. In 1851, Hippolyte Fizeau had investigated relative speeds of light in moving water. Fizeau discovered the unexpected result that measured light's speed is not a simple addition of light's speed through the medium and the medium's speed. 54 years later, Einstein's SR theory enabled Fizeau's results to be understood.

The Michelson-Morley experiment's results also intrigued Einstein. In 1887, detection of relative motion of matter through a stationary luminiferous aether did not happen for Albert Michelson and Edward Morley. That inability to detect such relative motion implied that the aether theory was unacceptable, and helped lead to SR. The Michelson-Morley experiment is very significant for acceptance of SR theory.

These experiments led to insights that significantly inspired Einstein during his development of SR theory in its Minkowski space-time. Hermann Minkowski developed the Minkowski diagram that illustrates the properties of space and time in SR. Minkowski space is considered to be a homogeneous space of the Poincaré group. In Newtonian mechanics, physicists use 3d vectors in Euclidean space, with absolute time. In SR, physicists use 4d vectors in Minkowski space-time.

This mathematical construction of dimensions enabled Einstein's SR theory to be formulated. The three dimensions of space from Euclidean space and the 4th dimension, of time by speed of light, are combined in a four-dimensional Minkowski manifold. For simplicity's sake, because the speed of light is a constant in SR, the dimension of time by speed of light is considered the dimension of time.

Einstein discovered that four-dimensional real vector space of Minkowski was very convenient for expressing his concepts. Events or four-vectors are the basic constituents of Minkowski space. A pseudo-Riemannian manifold is the complicated form of a Minkowski space. Minkowski space consists of four mutually orthogonal vectors $\{e_0,e_1,e_2,e_3\}$.

For Euclidean space, $(e_1)^2 = (e_2)^2 = (e_3)^2 = 1$.

For Minkowski space, $-(e_0)^2 = (e_1)^2 = (e_2)^2 = (e_3)^2 = 1$.

(Note that $(e_0)^2 = -1$.)

In SR, relativists manipulate the following matrix: $$\eta = \begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}.$$

Gravitational potential must be much less than c^2 for the Minkowski space-time mathematics to be appropriate.

Knowing Newtonian physics predicted incorrectly for extreme conditions, Albert Einstein strived to discover new physics laws. In 2014, mechanics includes the two most significant pursuits of classical mechanics and quantum mechanics (QM).

Classical mechanics, called Newtonian mechanics, consists of physical laws describing the motion of bodies acted upon by a system of forces. Classical mechanics is appropriate for large objects at low speeds. Newton was the first to develop an equation connecting force and momentum. Newton's Second Law:

$$\mathbf{F} = \frac{\mathrm{d}\mathbf{p}}{\mathrm{d}t} = \frac{\mathrm{d}(m\mathbf{v})}{\mathrm{d}t}.$$ **(Therefore, F = ma.)**

For a variable force, that is a function of r, acting upon a particle that moves from r_1 to r_2 along a path *C*, the line integral for the work done is:

$$W = \int_C \mathbf{F}(\mathbf{r}) \cdot \mathrm{d}\mathbf{r}\,.$$

A conservative force is a variable force that is a function of r, acting upon a particle that moves from r_1 to r_2 along any path *C*, and having a constant line integral for the work done:

$$W = \int_C \mathbf{F}(\mathbf{r}) \cdot \mathrm{d}\mathbf{r}\,.$$

W = constant ….. (going between r_1 and r_2).

Gravitational and electrostatic forces are conservative forces. Einstein realised that Newtonian equations and Maxwell's electromagnetic equations were incompatible with each other.

If a particle has mass m and is moving at speed v, it has kinetic energy:

$$E_\mathrm{k} = \tfrac{1}{2}mv^2\,.$$

For any large multi-particle object, the total kinetic energy equals the summation of the kinetic energies of all particles within the object. According to the work-energy theorem, the total work *W* done on a "constant mass m" particle, from position r_1 to r_2 , is equal to the change of the particle's kinetic energy E_k :

$$W = \Delta E_\mathrm{k} = E_{\mathrm{k},2} - E_{\mathrm{k},1} = \tfrac{1}{2}m\left(v_2^2 - v_1^2\right)\,.$$

Conservation of energy **states that, for conservative forces, constancy of total energy,** $\sum E = E_\mathrm{k} + E_\mathrm{p}$ **, in time exists.**

With the Lorentz force law, Maxwell's partial differential equations explain how charges, currents, and the fields themselves create and change electric and magnetic fields. Initial, unrefined examples of Maxwell's equations were published by James Clerk Maxwell in 1861. Physics enthusiasts need to realize that Maxwell's differential equations are not totally accurate, universal laws. Maxwell's equations provide a classical simplification of the less erroneous, more advanced quantum electrodynamics theory.

Maxwell's equations include universal constants: permittivity of free space = ε_0 ; permeability of free space = μ_0 . A vacuum contains no charges and no currents. Therefore, in a vacuum, charge ρ = 0, and current J = 0. In a vacuum, Maxwell's equations simplify to:

$$\nabla \cdot \mathbf{E} = 0 \qquad \nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t},$$
$$\nabla \cdot \mathbf{B} = 0 \qquad \nabla \times \mathbf{B} = \frac{1}{c^2}\frac{\partial \mathbf{E}}{\partial t}.$$

In a vacuum, the wave equations simplify to $\frac{1}{c^2}\frac{\partial^2 \mathbf{E}}{\partial t^2} - \nabla^2 \mathbf{E} = 0\,, \quad \frac{1}{c^2}\frac{\partial^2 \mathbf{B}}{\partial t^2} - \nabla^2 \mathbf{B} = 0\,,$

to reveal that the speed of light in a vacuum is $c = \frac{1}{\sqrt{\mu_0 \varepsilon_0}} = 2.99792458 \times 10^8\,\mathrm{m\ s^{-1}}$ **.**

Maxwell's derived wave equations for a vacuum give a sinusoidal plane wave as one special solution. Maxwell's equations explain the propagation of electromagnetic waves through space.

For extremely strong fields and extremely short distances, Maxwell's equations are inappropriate. Individual photons, non-classical light, and quantum entanglement of electromagnetic fields are predicted to not and never exist by Maxwell's equations, but, hey presto, they do exist. Theoretical physics and reality can be very confusing now in 2014.

More than one hundred years ago, confused by theoretical physics and universal reality, Einstein wrote, "Gradually, I despaired of the possibility of discovering the true laws by means of constructive efforts based on known facts." In 1905, Albert Einstein proposed his special relativity in his paper "On the Electrodynamics of Moving Bodies".

In his physics paper, important for SR, Einstein placed emphasis on explaining what simultaneity and simultaneous events are. If something happens at a specific location at a specific time, two events are simultaneous events: the happening and the time on a clock. This becomes more complicated when the events are occurring at different locations- especially if remote from each other. In SR, light travelling from A to B takes the same amount of time as light travelling from B to A. Light leaves A at time t_{A}**, is reflected at B at time** t_{B}**, and reaches A at time** t'_{A}**.**

Using two synchronized clocks gives that $t_{\mathrm{B}} - t_{\mathrm{A}} = t'_{\mathrm{A}} - t_{\mathrm{B}}.$

Einstein discusses assumptions for synchronism of clocks at any number of different points. If clock A synchronizes with clock B, then the reverse also happens. Further, if clock A synchronizes with clock B and clock C, those two clocks synchronize with clock A, but also synchronize with each other. This can be expanded to an infinite number of clocks. The time of an event is given by a stationary clock at the location of the event and simultaneous with the event.

The universal velocity of light in a vacuum is given by the equation

$\frac{2\mathrm{AB}}{t'_A - t_A} = c,$ **a constant.**

If there is an observer moving at velocity v with the rod moving at velocity v,

$$t_{\mathrm{B}} - t_{\mathrm{A}} = \frac{r_{\mathrm{AB}}}{c - v} \text{ and } t'_{\mathrm{A}} - t_{\mathrm{B}} = \frac{r_{\mathrm{AB}}}{c + v}$$

So it is not true that $t_{\mathrm{B}} - t_{\mathrm{A}} = t'_{\mathrm{A}} - t_{\mathrm{B}}$.

That means that, for an observer in the moving system, the two clocks, at A and B ends of the rod, are not synchronous, while, for an observer in the stationary system, the two clocks are synchronous. Simultaneity is not absolute: Two simultaneous events to observers at rest are not simultaneous events to observers in a moving system.

Reading Einstein's paper led to the following comparison:

$x^2+y^2=r^2$ is the equation of a circle. $x^2+y^2+z^2=r^2$ is the equation of a sphere. $x^2+y^2+z^2=c^2t^2$ is the equation of a spherical light-wave.

Therefore, a transformation of a spherical light-wave with constant velocity c gives another spherical light-wave with constant velocity c. Einstein mentioned that electric and magnetic forces are not independent of motion of the system of co-ordinates. A subset of the Poincaré group of symmetry transformations, Lorentz transformations were mathematically appropriate for relativity theory.

LORENTZ TRANSFORMATION: Observer *O* uses co-ordinate system (*t*, *x*, *y*, *z*). Observer *O′* uses co-ordinate system (*t′*, *x′*, *y′*, *z′*). The respective axes of the co-ordinate systems are collinear. A relative velocity between the two observers is *v* along the common *x*-axis; *O* measures *O′* to move at velocity *v* along the coincident *xx′* axes, while *O′* measures *O* to move at velocity −*v* along the coincident *xx′* axes. Also assume that the origins of both co-ordinate systems are the same, that is, coincident times and positions. If all these hold, then the co-ordinate systems are said to be in standard configuration. The inverse of the above Lorentz transformation causes the relationship between the primed and unprimed co-ordinates to be reversed, and causes negation of the uniform relative velocity. This implies that laws of physics do not change under a Lorentz transformation. For inertial reference frames in standard configuration, the Lorentz transformation is:

$$t' = \gamma\left(t - \frac{vx}{c^2}\right)$$

$$x' = \gamma(x - vt)$$

$$y' = y$$

$$z' = z$$

where *v* is relative velocity along the x-axis; *c* is light's speed;

$\gamma = \frac{1}{\sqrt{1-\beta^2}}$ **is the Lorentz factor;** $\beta = \frac{v}{c}$ **is the velocity coefficient along the x-axis. *β* and *γ* often used in relativistic literature. Many physicists use the matrix form of the equations:**

$$\begin{bmatrix} ct' \\ x' \\ y' \\ z' \end{bmatrix} = \begin{bmatrix} \gamma & -\beta\gamma & 0 & 0 \\ -\beta\gamma & \gamma & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} ct \\ x \\ y \\ z \end{bmatrix},$$

The principle of relativity implies that no privileged inertial reference frame exists, so the inverse transformations of frame *F′* to frame *F* must be given by the negative of frame *F* to frame *F′* , so simply negative *v* :

$$t = \gamma\left(t' + \frac{vx'}{c^2}\right)$$
$$x = \gamma\left(x' + vt'\right)$$
$$y = y'$$
$$z = z',$$

where the value of γ remains unchanged.

If one ignores the effects of gravity, then there are TEN BASIC WAYS OF DOING SHIFTS of space-time: translation through time, translation through any of the three dimensions of space, rotation around any of the three spatial axes, or a boost in any of the three spatial directions.

SR supplies the rules for transforming an electromagnetic field in one inertial frame into another inertial frame. The principle of relativity was redefined by Einstein to produce the constant speed of light in a vacuum, "c". This universal constant c is exactly 299,792,458 meters per second, because the length of the meter is defined from this constant and the international standard for time.

According to SR, *c* is the maximum speed at which all energy, matter, and information in the universe can move. c is the speed of electromagnetic radiation and gravitational waves.

"Constant light-speed c" was inspired by Maxwell's electromagnetic theory and the experimental non-existence of the luminiferous ether as the Michelson-Morley result. Einstein decided that both ether and an absolute state of rest do not exist.

Absolute universal time is used in classical mechanics, but SR time depends on inertial reference frame and spatial position. Classical mechanics involves an invariant time interval, but SR involves a variant time interval and an invariant space-time interval. Time and space are inseparable as the SR space-time continuum. Events occur at different times for different observers.

An "observer" is a specific inertial reference frame from where objects or events are measured. In SR, an observer is not an idiosyncratic, sentient human experiencing objects and events, but an observer is a specific mathematical context for evaluating objects and events.

An SR, locally Lorentz invariant frame can be defined in curved space-time. A "reference frame" is a non-accelerating, observational perspective in space-time, from which a position can be measured along 3 spatial axes and 1 temporal axis.

An "event" is a 4-co-ordinate reference point in space-time.

Although perspective changes, reality is what reality is. The time lapse depends on the relative velocities of the observers' reference frames.

The twin paradox, a thought experiment about a high-velocity spaceship twin and a stationary stay-on-Earth twin, predicts that the spaceship twin will come back to Earth and discover that the stationary twin has aged much more. Many twin paradox explanations

have been offered. What is important is that the twin paradox has been verified by experiments using atomic clocks. Similar time dilation occurs for muons falling through Earth's atmosphere as their decay rate reveals. In SR, time dilation is:

$$\Delta t' = \gamma\,\Delta t = \frac{\Delta t}{\sqrt{1-\frac{v^2}{c^2}}}$$

Note: Δ*t* is the proper time interval between two events at the same place for an observer A in some inertial frame. Δ*t*′ is the time interval between those same events, as measured by observer B, moving at relative velocity *v* with respect to observer A. Lorentz factor is:

$$\gamma = \frac{1}{\sqrt{1-\frac{v^2}{c^2}}}\,.$$

Schwarzschild improved upon SR equations of time dilation by adding gravitational components. In the Schwarzschild metric, the interval dt_E is given by

$$dt_{\mathrm{E}}^2 = \left(1-\frac{2GM_{\mathrm{i}}}{r_{\mathrm{i}}c^2}\right)dt_{\mathrm{c}}^2 - \left(1-\frac{2GM_{\mathrm{i}}}{r_{\mathrm{i}}c^2}\right)^{-1}\frac{dx^2+dy^2+dz^2}{c^2}$$

where: t_E is proper time; t_c is co-ordinate time. The co-ordinate velocity of the clock is given by

$$v^2 = \frac{dx^2+dy^2+dz^2}{dt_{\mathrm{c}}^2}.$$

Particle accelerators, especially at CERN, for the last 60 years, have tested SR's time dilation.

In Euclidean space, we define the Euclidean norm on R^n as the "length" of a vector x through square root:

$$\|\mathbf{x}\| = \sqrt{\mathbf{x}\cdot\mathbf{x}} = \sqrt{\sum_{i=1}^{n}(x_i)^2}.$$

Further, we define the Euclidean metric on R^n as:

$$d(\mathbf{x},\mathbf{y}) = \|\mathbf{x}-\mathbf{y}\| = \sqrt{\sum_{i=1}^{n}(x_i-y_i)^2}.$$

SR is a rotational symmetry of our space-time. SR can be stated as the invariance of any 4D space-time interval between two events when viewed from any inertial reference frame. A very useful four-vector is the position of an event in space-time, s = (x, y, z, ict).

Physics laws and the two SR postulates unite to predict the mass-energy equivalence. In developing SR, Einstein derived the moving particle's kinetic energy to be:

$$E_k = m_0(\gamma-1)c^2 = \frac{m_0c^2}{\sqrt{1-\frac{v^2}{c^2}}} - m_0c^2,$$

(with velocity v, rest mass m_0, and Lorentz factor γ). Further, Einstein derived the moving particle's momentum to be:

$$P = \frac{m_0v}{\sqrt{1-\frac{v^2}{c^2}}}.$$

Momentum is conserved when a collision occurs.
The relativistic ENERGY-MOMENTUM equation for a particle or a photon is:
$$E^2 - (pc)^2 = (mc^2)^2$$
where the *m* is the rest mass.
$E = mc^2$ is the mass-energy equivalence equation.
In physics, classical mechanics' Galilean transformations are replaced by SR's Lorentz transformations. According to Einstein, the principle of relativity applies for all physics laws. SR relative velocity is mathematically more complicated than classical relative velocity. To an observer, as a particle's velocity approaches light's velocity, its relativistic mass increases more and more rapidly to impede acceleration.
Both matter and radiation have energy and momentum. The SR two postulates are about space-time, not about matter or radiation.
In his 1905 paper, Einstein stated that both energy and momentum conservation laws apply in SR. Einstein believed that an isolated system's total energy, neither created nor destroyed, but modified in form, remains constant as time progresses.
REST MASS and RELATIVISTIC MASS are the two types of mass defined in SR. Rest mass is invariable for all observers in all reference frames. Relativistic mass is variable with relative velocity of the observer.
An overall stationary, multi-particled, confined volume does not have mass that is the sum of its particles' rest masses, but has mass that is progressively more as its particles move faster.
Massless, a photon and a theoretical graviton move at light's speed in every reference frame.
Conservation of energy implies conservation of relativistic mass for any observer and any inertial frame.
For a totally isolated system, SR uses conservation of energy, conservation of momentum, and conservation of relativistic mass for any observer in any specific inertial frame. Energy, momentum and relativistic mass will vary for different observers in different inertial frames. The invariant rest mass will remain the same for all observers.
In 1915, ten years after his SR, Albert Einstein published his GR theory that is more generalised with gravitational effects.
GR and quantum theory are the two major theories of modern physics. How these two theories can be combined is the most significant question for theoretical physicists. Attempts to answer this question have led to failures so far at very high velocities.
GR, incorporating non-Euclidean geometry that becomes Euclidean as gravity lessens to zero, then becomes SR.
SR with QM gives relativistic QM. GR with quantum theory gives quantum gravity that suffers problems. The Theory of Everything, that is an attempt to derive all of physics from the one theory, has not been a success.
The two most successful theories, GR and QM, are incompatible with each other.

In 1913, Niels Bohr introduced the Bohr model of the atom held together by electromagnetic forces. To create the mathematics, Bohr added a quantum rule. The hydrogen atom emitted photons with energy:

$$E = E_i - E_f = R_{\mathrm{E}} \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

***(n_f* = final energy level; *n_i* = initial energy level).**

With a photon's energy as $E = \frac{hc}{\lambda}$, **the photon's wavelength is from the Rydberg formula:** $\frac{1}{\lambda} = R \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$.

In 1928, Paul Dirac created an important relativistic wave equation called the Dirac equation. Relativistic wave equations predict the behavior of high-velocity particles. The Dirac equation explains all spin-½ particles, including electrons and quarks, and agrees with principles of QM and SR. The Dirac equation explained the hydrogen spectrum very well, and predicted that anti-matter exists before anti-matter was experimentally discovered.

QM needed SR before it could explain spin. The fact that anti-particles exist caused theoretical physicists to conclude that relativistic QM needs to be drastically improved to create a better theory of particle interactions.

Mostly, we observe matter much more often than anti-matter. Particle accelerators often produce anti-matter as individual anti-particles. Physicists know that, throughout the universe, high-velocity particle collisions create anti-particles. Anti-matter reacts with matter for annihilation.

The electromagnetic field and the gravitational field are the only two fields with infinite range. Finding the proper axioms for quantum field theory is still an open and difficult problem in mathematics. One of the Millennium Prize Problems—proving the existence of a mass gap in Yang–Mills theory—is linked to this issue.

The Planck length ℓ_{P} **is defined as** $\ell_{\mathrm{P}} = \sqrt{\frac{\hbar G}{c^3}} \approx 1.616\,199(97) \times 10^{-35}\ \mathrm{m}$ **and is extremely small.**

KINETIC MOLECULAR THEORY OF GASES:

I have always been very impressed by The Kinetic Molecular Theory of Gases. Therefore, I will attempt to add these ideas to my unifying field theory of physics equations. The Kinetic Molecular Theory for ideal gases is based on the following assumptions:

1. **The gas consists of very small particles, each of which has a mass.**
2. **The number of molecules is large such that statistical treatment can be applied.**
3. **These molecules are in constant, random motion. The rapidly moving particles constantly collide with each other and with the walls of the container.**
4. **The collisions of gas particles with the walls of the container holding them are perfectly elastic.**

5. **The interactions between molecules are negligible. They exert no forces on one another except during collisions.**
6. **The total volume of the individual gas molecules added up is negligible compared to the volume of the container. This is equivalent to stating that the average distance separating the gas particles is relatively large compared to their size.**
7. **The molecules are perfectly spherical in shape, and elastic in nature.**
8. **The average kinetic energy of the gas particles depends only on the temperature of the system.**
9. **Relativistic effects are negligible.**
10. **Quantum-mechanical effects are negligible. This means that the inter-particle distance is much larger than the thermal de Broglie wavelength and the molecules can be treated as classical objects.**
11. **The time during a collision of a molecule with the container's wall is negligible as comparable to the time between successive collisions.**
12. **The equations of motion of the molecules are time-reversible.**
13. **In addition, if the gas is in a container, the collisions with the walls are assumed to be instantaneous and elastic.**

Cosmological expansion rate indicates that 90% of all matter is dark matter with gravitational effects, but no electromagnetic effects. Evidence for this suggests that our present physics theories are inadequate. SR is a very important part of all modern physics theories including quantum field theory and string theory. String theory requires the existence of extra spatial dimensions for its mathematical consistency. For specified circumstances, GR can be reduced to SR, and, for other specified circumstances, SR can be reduced to Newtonian mechanics. Special relativity has been popular for more than one hundred years.

Einstein's general relativity led to predicted space-time deformation and black holes. Four laws of black hole mechanics, similar to those of thermodynamics, have been created by Stephen Hawking, James Bardeen and Brendan Carter. Hawking's addition of quantum mechanics to the black hole's mathematics, in 1974, inspired a high percentage of humans to believe we know very much about the black hole.

Quantum mechanics and general relativity developed separately because nobody could discover the mathematical connection between them as the problem is extremely difficult to solve. Hawking radiation is a tribute to Stephen Hawking's mathematical ability and creativity, and his realisation certainly improved black hole research by showing that the supposed black hole is much more than a product of Einstein's general relativity.

What happens when things cross the theorised black hole's theorised event horizon is an exciting mind game in which one's spouse might turn into spaghetti or smaller than an electron as anything can happen in the black hole that is seemingly magical. General relativity and quantum mechanics lead to different predictions for what happens in the

black hole because theoretical physics is very theoretical and, sometimes, goes far beyond reality to where mathematicians can be very creative and maybe zany.
Worldwide, in January 2014, science journalists delivered surprising articles about Stephen Hawking's announcement that there are no event horizon and no black hole following the theoretical equations, so, obviously, the mathematics is erroneous. Stephen Hawking's statement about the event horizon not existing is major because his confidence in the black hole mathematics has vanished, so the mathematics of theoretical physics must be improved to solve this extremely difficult problem.
Non-existence of the theorised black hole is an extraordinary shock to physicists who know astronomers have taken wonderful pictures of what were believed to be black holes. There really is something in the universe, like a black hole, that follows other mathematical equations.
Another major problem for mathematical physicists has been that they do not have an adequate theoretical generalization from which the current NAVIER-STOKES EQUATION, for fluid dynamics, can be derived.

ALBERT EINSTEIN WRONG

During many thousands of hours, over many years, I created 'BEYOND ALBERT EINSTEIN'S RELATIVITY: UFT PHYSICS' (BAER). To me, that paper suggesting that many dimensions existed, seemed to considerably surpass Albert Einstein's theoretical physics papers on related topics. Recent neutrino misbehaviour at CERN seemed to validate my BAER equations. But, during early 2013, while very sick due to cancer and chemotherapy, while hallucinating, I suddenly solved a mystery that had confused both Albert Einstein and me. Intellectually shocked, I realised that, not following Einstein's or my equations, events are irreversible with time and do not occur in a 4-dimensional, space-time, relativistic universe. ……..

NEED FOR THIS NEW PHYSICS SOLUTION

Soon after Albert Einstein's General Relativity, that predicted reversibility of events with time, was published, Einstein and others proposed experimental tests of his theory of gravitation, which was based on a constant velocity-of-light in a vacuum. Subsequent predictions have included bending of light passing a mass, the shift of Mercury's perihelion, redshift of light's wavelength due to gravity, unusual masses called black holes, and gravitational waves. Now, after a hundred years, due to a shocking neutrino velocity measurement, due to confusing conjecture about black hole mathematics, due to failure to blend with quantum equations, due to failure to observe the major prediction called gravitational waves, and due to obvious irreversibility of events with time, physicists must concede that General Relativity consists of and provides incorrect equations.

The OPERA detector at LNGS, designed for the study of neutrino oscillations in appearance mode, precisely measured neutrino velocity over the 730 km baseline of the CNGS neutrino beam sent from CERN to LNGS through the Earth's crust. The data included 16,000 neutrino interaction events detected by OPERA. The very sensitive equipment enabled physicists to come to the unexpected conclusion that neutrinos were travelling faster than light in a vacuum. Whether the neutrinos travelled faster than light or both neutrinos and light travelled faster, General Relativity's equations seemed incorrect for this situation. Though extremely thought-provoking, the event was later said to be due to a technical error.

Whether correct or incorrect, prediction of neutrino velocity is not the only failure of General Relativity. Einstein's theory predicted that disturbances in space-time should generate radiation called gravitational waves. Despite much intensive, extremely expensive, specific research, this major prediction of General Relativity has never been observed in reality. By now, after diligent research, theoretical physicists should accept that gravitational waves, as predicted from Einstein's equations, do not and have never existed. Further, this implies that General Relativity is very probably incorrect.

That quantum equations, after such a long time, have never been incorporated adequately into General Relativity is a major problem for theoretical physicists. Albert Einstein struggled, during his latter thirty years, to formulate a unifying theory because, to him and many others, that unification is the major intellectual goal of theoretical physics. Many would agree that, without quantum equations, General Relativity is incorrect.

Added to predictions about gravitational waves, and a lack of quantum equations, General Relativity has led to equations causing the prediction that a theoretical enigma called a black hole exists. Although physicists have stated that they have discovered where some black holes might be, those physicists have not proven that those extremely dense masses follow black hole equations derived from General Relativity.

Unfortunately, many people, especially physicists, are obsessive supporters of Albert Einstein's General Relativity. They overstress that bending of light passing a large mass was observed during the solar eclipse of 1919, when the Sun was silhouetted against the Hyades star cluster. General Relativity is only one of many theories that can lead to that specific result. One correct, predicted result does not mean that predicted results for bending of light-rays by billions of stars with much stronger gravity than the Sun's gravity will be correct. Nobody knows everything about light from a quasar bent by a closer galaxy's gravity as it travels to Earth. Although physicists have predicted that a black hole bends light so much that the background stars will be seen as concentric rings, more versatile equations, with a variable velocity-of-light, will give virtually the same effect.

Though General Relativity enabled a good prediction about the perihelion shift of Mercury's elliptical path around the Sun, other subsequent theories, created during the last one hundred years, included that accuracy as their creators attempted to incorporate more physics concepts and facts.

General Relativity does not need to be entirely correct for prediction that the wavelength of light passing through a gravitational field will undergo redshift. The equations might not be sufficient or correct for predicting redshifts caused by massive stars.

I propose that gravitational waves were never found because they do not exist as separate waves. After a century of Albert Einstein's General Relativity, that incorrectly leads to reversibility of events with time, and due to precise measurement of neutrino velocity possibly showing an unpredicted result, astute physics theorists realise that General Relativity is incorrect, and must be replaced by a major theory encompassing more aspects of theoretical physics.

During thousands of hours, I created my multi-dimensional physics paper entitled 'BEYOND ALBERT EINSTEIN'S RELATIVITY: UFT PHYSICS'. During that paper's creation, over many years of effort, and and after then, I hoped that the equations included would be accepted by intelligent theoretical physicists, and would stimulate positive advancements for improving human lives. On 29th April 2013, very sick from cancer and chemotherapy, without access to notes or textbooks, after watching a televised show about TIME, I quickly scribbled a short, erratic paper about 'IRREVERSIBILITY OF EVENTS WITH TIME'. Now, I accept that the dimensions that exist are much more peculiar than humans, including Albert Einstein, ever believed. Due to that inspiration, I modified my previous UFT equations drastically and created a revolutionary physics paper entitled EINSTEIN WRONG: UFT PHYSICS that led to a succession of twelve improved papers.

UFT PHYSICS

Using variable velocity-of-light, and using a peculiar dimensional geometry that seems like Albert Einstein's 4-dimensional geometry, I reassemble basic formulae and equations of physics into a comprehensible mathematical unification for any two-particle system and any multi-particle system. Reducing physics to merely one equation simplifies physics and reveals a structural brilliance to existence. I expound a revolutionary equation relating mass and wavelength together, an equation that leads to elegant calculus rather than present complications, modifies conceptions of any particle's duality of nature. I modify Schwarzschild's solution to ramifications of Einstein's General Theory, so that it can be better applied

to any binary system, opens up new theoretical adventures for physicists. I deliver equations that explain how attractive forces become repulsive forces, and how repulsive forces become attractive forces, and answer a multitude of seemingly-unfathomable questions so far inadequately explained. I reveal that non-relativistic dimensionality exists, and successfully include an advanced modification of The Kinetic Molecular Theory of Gases. I construct a revolutionary concept of Time that will stimulate philosophy and many other intellectual areas.

After I created UFT for a reversibility of events with time, I recently realised that I needed to create different equations for an irreversibility of events with time.

…...

CREATING UFT PHYSICS

During the many years of creating my version of UFT physics, I achieved many theoretical physics accomplishments. Using variable velocity-of-light, and using a peculiar dimensional geometry that seems like Albert Einstein's 4-dimensional geometry, I reassembled basic formulae and equations of physics into a comprehensible mathematical unification for any two-particle system and any multi-particle system. Reducing physics to merely one equation simplified physics and revealed a structural brilliance to existence. I expounded a revolutionary equation that related mass and wavelength together, an equation that led to elegant calculus rather than present complications, modified conceptions of any particle's duality of nature. I modified Schwarzschild's solution to ramifications of Einstein's General Theory, so that it could be better applied to any binary system, and opened up new theoretical adventures for physicists. I delivered equations that explained how attractive forces became repulsive forces, and how repulsive forces became attractive forces, and answered a multitude of seemingly-unfathomable questions so far inadequately explained. I revealed that non-relativistic dimensionality exists, and successfully included an advanced modification of The Kinetic Molecular Theory of Gases. I constructed a revolutionary concept of Time that would stimulate philosophy and many other intellectual areas. I had not worried about the fact that these mathematical accomplishments were all for the situation of reversibility of events with time because I had unthinkingly accepted Albert Einstein's opinion about this issue.

By coincidence, a televised physics program about Time came on my television when I was undergoing chemotherapy. As I watched that program, it became obvious, to me, that a major error exists in current theoretical physics. Albert Einstein's 'Special Relativity' and

his 'General Relativity', and my 'Beyond Albert Einstein's Relativity: UFT Physics' all predict reversibility of events with time in this universe, but this prediction is erroneous. In our real universe, if we drop a drinking-glass onto a tiled floor, the glass shatters so pieces scatter around. Most of us agree that it is impossible for the glass to re-assemble into its original form. Billions of such events provide evidence that events in our universe are not reversible with time. Theoretical physics needs to predict irreversibility of events with time.

SPATIAL GEOMETRY

Spatial geometry used to consist of three dimensions:

$\underline{s} = x\underline{e}_1 + y\underline{e}_2 + z\underline{e}_3$.

$\delta \underline{s} = \delta x\underline{e}_1 + \delta y\underline{e}_2 + \delta z\underline{e}_3$.

$(\delta \underline{s}).(\delta \underline{s}) = (\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2$.

In Special Relativity, Albert Einstein used four dimensions in a space-time continuum that replaced the previous three-dimensional geometry. The four-dimensional geometry Einstein used can be written as the following:

$\underline{s} = x\underline{e}_1 + y\underline{e}_2 + z\underline{e}_3 + jct\underline{e}_4$.

$\delta \underline{s} = \delta x\underline{e}_1 + \delta y\underline{e}_2 + \delta z\underline{e}_3 + jc(\delta t)\underline{e}_4$.

$(\delta \underline{s}).(\delta \underline{s}) = (\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2 + (jc(\delta t))^2$

$= (\delta x)^2 + (\delta y)^2 + (\delta z)^2 - c^2 (\delta t)^2$.

<Note that in Einstein's equations, I am using j = square root of -1, and c is a constant velocity-of-light. >

In the above equations, $\underline{e}_1$, $\underline{e}_2$, $\underline{e}_3$, $\underline{e}_4$ are all perpendicular to each other, and the modulus of each is 1. Geometrically, it is difficult to comprehend what $\underline{e}_4$ is. Mathematically, it is merely an extra dimension and much easier to comprehend.

In my BEYOND ALBERT EINSTEIN'S RELATIVITY: UFT PHYSICS paper previously mentioned, I modified the four-dimensional equation that Einstein used to the following:

$(\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2 + j^2 (\delta (ct))^2$

$= (\delta x)^2 + (\delta y)^2 + (\delta z)^2 - (\delta (ct))^2$.

<Note that my c differs from Einstein's because my c is a variable while his is constant. >

Unfortunately, Einstein's equation

$(\delta \underline{s}).(\delta \underline{s}) = (\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2 + (jc(\delta t))^2$

$= (\delta x)^2 + (\delta y)^2 + (\delta z)^2 - c^2 (\delta t)^2$

and my equation

$(\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2 + j^2 (\delta (ct))^2$

$= (\delta x)^2 + (\delta y)^2 + (\delta z)^2 - (\delta (ct))^2$

both retain their same quantities when t is changed to (-t). The equations lead to reversibility with time that does not exist.
For prediction of irreversibility of events with time in this real universe, $(ds)^2$ must contain a change-in-time element this is not squared. Surprising me, the best solution that I can create is a peculiar three-dimensional geometry expressed as the following:
$\underline{s} = (x + jct/3^{1/2})\underline{e}_1 + (y + jct/3^{1/2})\underline{e}_2 + (z + jct/3^{1/2})\underline{e}_3$.
Note that $j = (-1)^{1/2}$. Further, the equation for this $\underline{s}$ is as comprehensible as the $\underline{s}$ used by Albert Einstein in Special Relativity. That leads to the following equation that is very interesting.
$(\delta \underline{s}).(\delta \underline{s}) = (\delta s)^2 = (\delta x)^2 + (\delta y)^2 + (\delta z)^2 + 2j/3^{1/2}(\delta (ct))(\delta x + \delta y + \delta z) - (\delta (ct))^2$.
<Note that $(\delta s)^2$ for t does not equal $(\delta s)^2$ for (-t). Thus, $(\delta s)^2$ is irreversible with time. The equation is like a relativistic equation but with a bewildering component. Mathematically, I can comprehend this equation, but I cannot comprehend its associated geometry. Perplexing me, the inserted formula seems to defy conscious perception. Possibly, we perceive some of this universe's spatial geometry subconsciously.>
What needs to be introduced is mass. In my BAER physics paper, using Albert Einstein's mass from The Special Theory of Relativity, I manipulated Albert Einstein's
$E = Mc^2 = M_0c^2/(1 - v^2/c^2)^{1/2}$.
Because Albert Einstein's c was considered to be a constant, I converted his energy equation to the following:
$M = \{M_0(1 - v^2c^{-2})^{-1/2}\}$.
$E = \{Mc^2\} = \{M\}c^2$.
I restate Einstein's equation giving kinetic energy as
$\{Mc^2\} = \{M_0c^2(1 - v^2c^{-2})^{-1/2}\}$.

CONSEQUENCES OF SPECIAL RELATIVITY

In 'RELATIVITY The Special And The General Theory', p44-48, Albert Einstein wrote: The special theory of relativity "has considerably simplified the theoretical structure" of electrodynamics and optics.
…. "The special theory of relativity has rendered the Maxwell-Lorentz theory so plausible, that the latter would have been generally accepted by physicists even if experiment had decided less unequivocally in its favour."
…. "Classical mechanics required to be modified before it could come into line with the demands of the special theory of relativity. For the main part, however, this modification affects only the laws for rapid motions, in which the velocities of matter v are not very small as compared with the velocity of light."
…. "In accordance with the theory of relativity the kinetic energy of a material point of mass m is no longer given by the well-known expression $^1/_2mv^2$, but by the expression $mc^2(1 - v^2/c^2)^{-1/2}$. This expression approaches infinity as the velocity v approaches the velocity of light c. The velocity must therefore always remain less than c, however great may be the energies used to produce the acceleration."

…. "The most important result of a general character to which the special theory of relativity has led is concerned with the conception of mass. Before the advent of relativity, physics recognised two conservation laws of fundamental importance, namely, the law of the conservation of energy and the law of the conservation of mass; these two fundamental laws appeared to be quite independent of each other. By means of the theory of relativity they have been united into one law."
…. "According to the theory of relativity, action at a distance with the velocity of light always takes the place of instantaneous action at a distance or of action at a distance with an infinite velocity of transmission. This is connected with the fact that the velocity c plays a fundamental role in this theory."

Because his velocity-of-light is constant, Albert Einstein's equations can be rearranged to create the following equations:
$\{M^2c^4(c^2 - v^2)\} = \{M_o{}^2c^6\}$.
$\{M^2(c^2 - v^2)\} = \{M_o{}^2c^2\}$.
The latter equation is as accurate as Albert Einstein's other equations used for energy and mass in his Special Theory of Relativity.

VARIABLE VELOCITY-OF-LIGHT PAPERS

Many physicists have researched and are researching the variability of light. Read the abstracts below.
'Is The Velocity of Light Constant in Time?' in Galilean Electrodynamics, Vol. 4, no. 5, Sept/Oct 1993, by Alan Montgomery, Mathematician, 218 McCurdy Drive, Kanata, Ontario K2L 2L6 Canada, and Lambert Dolphin, Physicist, 1103 Pomeroy Avenue, Santa Clara, CA 95051.
HIS ABSTRACT
The possibility that the velocity of light, c, is not a fixed constant is reconsidered by statistical analysis of the historical measurements collected from four sources. Our hypothesis testing of the selected data shows the measured value of the velocity of light has decreased over the past 250 years. Furthermore, the probability of some systematic or experimental problem was found to be low. Brief analysis of constants other than c suggests that those constants which involve atomic phenomena and units of time are also apparently changing. A third set of constants with no obvious dependence on c were analyzed and show no apparent variability with time. A variable velocity of light implies that atomic clocks and dynamical clocks do not run in step-that atomic time has been decreasing with respect to dynamical time.

'An Analysis of the Values of the Speed of Light to Determine Appropriate Data to Test the Setterfield Hypothesis' by Alan Montgomery, at the Pittsburgh Third International Conference on Creationism, Summer 1994.
HIS ABSTRACT

The velocity of light data from four different sources are tabulated, edited, and analyzed to provide data sensitive enough to detect a decrease [in c] of the size claimed by Setterfield and Norman. Data is analyzed by weighted regression, time, distribution, accuracy and precision to test for a significant decrease and any influences which might help identify its cause(s).

'The Atomic Constants, Light, and Time' by Barry Setterfield and Trevor Norman. August 1987. This was an invited research paper prepared for Lambert Dolphin who was at that time a Senior Research Physicist at SRI International, Menlo Park, California. Not an official SRI report. You may write Barry Setterfield at Box 318, Blackwood, S.A. 5051, Australia.

HIS ABSTRACT

The behavior of the atomic constants and the velocity of light, c, indicate that atomic phenomena, though constant when measured in atomic time, are subject to variation in dynamical time. Electromagnetic and gravitational processes govern atomic and dynamical time respectively. If conservation laws hold, many atomic constants are linked with c. Any change in c affects the atom. For example, electron orbital speeds are proportional to c, meaning that atomic time intervals are proportional to 1/c. Consequently, the time dependent constants are affected. Therefore Planck's constant, h, may be predicted to vary in proportion to 1/c as should the half-lives of the radioactive elements. Conversely, the gyromagnetic ratio, g, should be proportional to c. And variation in c, macroscopically, therefore reflects in the microcosm of the atom. A systematic, non-linear decay trend is revealed by 163 measurements of c in dynamical time by 16 methods over 300 years. Confirming trends also appear in 475 measurements of 11 other atomic quantities by 25 methods in dynamical time. Analysis of the most accurate atomic data reveals that the trend has a consistent magnitude in all quantities. Lunar orbital decay data indicate continuing c decay with slowing atomic clocks. A decay in c also manifests as a red-shift of light from distant galaxies. These variations have thus been recorded at three different levels of measurements: the microscopic world of the atom, the intermediate level of c measurements, and finally on an astronomical scale. Observationally, this implies that the two clocks measuring cosmic time are running at different rates. Relativity can be shown to be compatible with these results. In addition, gravitational phenomena are demonstrated invariant with changes in c and the atom. Observational evidence also demands consistent atomic behavior universally at any given time, t. This requires the permeability and metric properties of free space to be changing. In relativity, these attributes are governed by the action of the cosmological constant, Lambda, proportional to c squared, whose behavior can be shown to follow an exponentially damped form... This is verified by the c data curve fit. (Note: A dynamical second is defined as 1/31,556,925.9747 of the earth's orbital period and was standard until 1967. Atomic time is defined in terms of one revolution of an electron in the ground state

orbit of the hydrogen atom. The atomic standard by the cesium clock is accurate to limits of ± 8 x 10-14.

- **Implications of Changing Constants, by Lambert Dolphin**
- **A Layman's Guide to the CDK Debate, by Malcolm Bowden**
- **Atomic Behavior, Light And The Red-Shift: Abstract and Summary, by Barry Setterfield.**

A Quotation

"We know that the discovery of the fact that the speed of light, when measured both in the direction of the rotation of the earth and in the direction opposite to that rotation, is invariable, has confronted modern astronomers with the alternative either of accepting the immobility of the earth or else of rejecting the usual notions of time and space. Thus it was that Einstein was led into considering space and time as two relative dimensions, variable in function of the state of movement of the observer, the only constant dimension being the speed of light. The latter would everywhere and always be the same, whereas time and space vary in relation to one another: it is as if space could shrink in favor of time, and inversely...

"That the movement of light is a fundamental 'measure' of the corporeal world we willingly believe, but why should this measure itself be a number, and even a definite number? ...Now, what would happen if the constant character of the speed of light ever came to be doubted---and there is every likelihood that it will be sooner or later---so that the one fixed pivot of Einstein's theory would fall down? The whole modern conception of the universe would immediately dissolve like a mirage."--Titus Burckhardt, Mirror of the Intellect: Essays on Traditional Science and Sacred Art. (State University of New York Press; Albany, 1987), pp. 27-28.

'On the Variation of Vacuum Permittivity in Friedmann Universes' by William Q. Sumner mailto:wsumner@cerf.net , Box 588, Kittitas, WA 98934; The Astrophysical Journal, 429: 429-491, 1994 July 10; Received 1993 March 31: accepted 1994 January 14.

HIS ABSTRACT

Vacuum permittivity, the measure of strength of electric fields in a vacuum, is a function of the spacetime geometry of Einstein's general relativity. This dependence on geometry was noted over 40 years ago by C. Moeller (1952) and has remarkable consequences. Variation in vacuum permittivity breaks the equivalence of physical measurements and mathematical coordinates postulated by Einstein. Physical lengths, as measured by a rigid rod, and physical times, as measured by an atomic clock, are not equivalent to the mathematical lengths and times of general relativity. This changes some concepts of space and time, invalidates stronger interpretations of the principle of equivalence, and requires that care be exercised in interpreting the speed of light. The laws of physics must be carefully used to understand the essential relationships between mathematical spacetime and physical measurements.

For Friedmann universes, vacuum permittivity is directly proportional to the Friedmann radius and is therefore a function of time. As the size of the universe evolves, the changing strength of the electrical force between charges shifts atomic energy levels, changing the wavelengths of emitted light. This shift in photon emission due to the evolution of electrical attraction in the atom is twice as large as evolutionary photon shift. Considered together, atomic and photon evolution reverse the interpretation of Hubble redshift to imply that the Friedmann universe is presently collapsing.

'A Physical theory based solely on the first postulate of relativity' by J.P. Hsu, Leonardo Hsu, Physics Department, University of Massachusetts, North Dartmouth MA 02747, and Physics Department, Harvard University, Cambridge, MA 02138, respectively. Physics Letters A 196 (1994) 1-6.
HIS ABSTRACT
Using the first postulate of relativity only, we develop a general theory, termed tajii relativity, which has four-dimensional symmetry and is consistent with experiments. Within this framework the speed of light is no longer a universal constant. Thus, quantum electrodynamics has only two fundamental constants, e(bar) and J, which are the analogues of e and h(bar). Some new results are implied.
Physics Letters A 196 (1994) 1-6.

'Quantum Vacuum Fluctuations: A New Rosetta Stone of Physics?': Everything for Nothing; The Energetic Vacuum: Implications For Energy Research; Polarizable-Vacuum (PV) representation of general relativity (PDF); in Quantum Foam, New Scientist 19 June 1999, by Dr. H. E. Puthoff, Institute for Advanced Studies 1301 Capital Of Texas Highway S., Suite B 121 Austin, Texas 78746 ph(512) 328-5751.
Note added July 1995: Barry Setterfield of Australia is currently working on a new cosmological model involving a near-static universe, zero-point energy, and a linearly decreasing velocity of light after creation until relatively recent times (followed by an exponential tail in the very recent epoch). Setterfield believes he has an explanation for a quantized red-shift of light from distant stars (U. of Arizona Astronomer Wm. Tifft's recent discoveries). Atomic Behavior, Light And The Red-Shift: Abstract and Summary. Hal Putoff's work is therefore believed by Setterfield to be especially relevant to developing models of the universe consistent with a decrease in the speed of light over time. For some possible theological implications see What Holds The Universe Together?

'Physical Constants and Evolution of the Universe', by V.S. Troitskii, Radiophysical Research Institute, Gorky, USSR, in Astrophysics and Space Science 139 (1987) 389-411.
HIS ABSTRACT
A cosmological model is discussed which is based on interpretation of the red shift by decrease of the light speed with time everywhere in the Universe beginning with a certain moment of time in the past. The model is described by a metric in which the light speed depends on time and the radius of the curvature of three-dimensional space remains

constant (c-metric). It is shown that this metric leads to the same observed facts and formulas of different characteristics that the metric of standard cosmology does but with essentially different physical interpretation. Such a property is the consequence of conformity of spaces being defined by both metrics. The agreement with the fundamental physics laws is achieved by introducing the evolution of a number of other fundamental constants synchronously with the variation of the light speed. The model considered connected the evolution of the Universe with evolution of physical constants and permits explaining some unclear phenomena--for example, a high isotropy of the relict background and superluminal speed in quasars.

RECENT VARIABLE-VELOCITY OF LIGHT PAPERS

'SNe Data Analysis in Variable Speed of Light Cosmologies without Cosmological Constant', by Pengfei Zhang, and Xianbe Meng, Dept of Physics, Nunkai University, Tianjin 300071, China (Dated: May 1, 2014)

THEIR ABSTRACT

In this work, we aim to show the possibilities of the variable speed of light (VSL) theory in explaining the type Ia supernovae observations without introducing dark energy. The speed of light is assumed to be scale factor dependent, which is the most popular assumption in VSL theory. We show the modified calculation of the distance modulus, and the validity of the redshift-scale factor relation in VSL theory. Three different models of VSL are tested SNe data-sets with proper constraints on the model parameters. The comparison of the three models and flat ACDM in distance modulus is showed. Some basic problems and the difficulties of the confirmation of the VSL theory are also discussed.

'Variable Speed of Light Cosmology, Primordial Fluctuations and Gravitational Waves', by J.W.Moffat, Perimeter Institute for Theoretical Physics, Waterloo, Ontario N2L, 2Y5, Canada, and Deppt of Physics and Astronomy, University of Waterloo, Waterloo, Ontario N2L, 3G1, Canada (Dated: October 31, 2014)

HIS ABSTRACT

A variable speed of light (VSL) cosmology is developed with a spontaneous breaking of Lorentz invariance in the early universe. A non-minimal electromagnetic coupling to curvature and the resulting quantum electrodynamic vacuum polarization dispersive medium can produce $c >> c_o$ in the early universe, where c_o is the measured speed of light today. Higher derivative curvature contributions to the effective gravitational action and quantum gravity vacuum polarization can produce a dispersive medium and a large increase in the speed of gravitational waves today. The initial value problems of cosmology are solved: the horizon and flatness problems. The model predicts primordial scalar and tensor fluctuation spectral indices $n_s = 0.96$ and $n_t = -0.04$, respectively.

'Speed of Light May Not Be Constant, Physicists Say' by Jesse Einspak, LiveScience Contributor (Dated: 27 April 2013)
QUOTES: 'Einstein's theory of special relativity sets of the speed of light, 186,000 miles per second (300 million meters per second). But some scientists are exploring the possibility that this cosmic speed limit changes.' …. 'Two papers, published in the European Physics Journal D in March, attempt to derive the speed of light from the quantum properties of space itself. Both propose somewhat different mechanisms, but the idea is that the speed of light might change as on alters assumptions about how elementary particles interact with radiation. Both treat space as something that isn't empty, but a great big soup of virtual particles that wink in and out of existence in tiny fractions of a second.'

TWIN PARADOX

In Special Relativity, in 1905, Albert Einstein predicted that two synchronised clocks would become non-synchronised if one travels away and returns. The clock that travels away and returns will lag behind the other clock. Many physicists believe this is a paradox of Special Relativity, the Twin Paradox.

'Time Is Of The Essence In Special Relativity', Part 2, The Twin Paradox, by Dr. S. Peter Rosen, Office of Science, U.S. Department of Energy:
"The subject started out neither as a paradox, nor about twins. In his original paper on Special Relativity, Einstein noted what he called a theorem about synchronized clocks: if two such clocks, A and B, are initially at the same point, and B travels round a closed path back to A, the clock B will run slow relative to A. Behind this theorem is the time dilation property of Special Relativity: if clock B is moving with constant speed v relative to clock A, a time interval measured by clock B will be amplified by the factor $\Gamma = 1/\sqrt{\{1-(v/c)2\}}$ when measured by clock A, where c is the speed of light (c=300,000 kilometers per second)." ……. "Einstein's theorem was known as the clock paradox until 1911, when Paul Langevin and others re-expressed it in terms of twins." ……. "Now, the first step in assessing the issue of the Twin Paradox is to ask is whether time dilation takes place in the real world. The answer is a resounding "Yes!" During the past 60 years, we have discovered families of elementary particles with short lifetimes in the range of a few microseconds (millionths of a second) all the way down to several picoseconds (millionths of a microsecond). Among these particles is the muon, a particle similar in many ways to the electron, but about 200 times heavier. At rest, or moving very slowly compared with the speed of light, the muon decays into an electron and two other particles, known as neutrinos, typically in 2.2 microseconds.
Muons are created in the upper atmosphere, roughly 10 kilometers above the surface of the Earth, when cosmic rays collide with the atoms in the atmosphere. Muons can subsequently be detected at the surface of the Earth, or even as much as 1 kilometer

below the surface. How can they travel such long distances in 2.2 microseconds, when muons cannot exceed that of light, and so the farthest they can travel is less than 2/3 of a kilometer (2.2 microseconds multiplied by 300,000 km/second = 0.66 km)? The answer has to be that, to an observer on the surface of the Earth, the muon is travelling very close to the speed of light, and time dilation enables it to survive far longer than its 2.2 microseconds lifetime." ……. "We can actually realize the situation envisaged by Einstein in his original 1905 paper using muons. Muons can be produced in the laboratory through the same types of collision as take place in the upper atmosphere. Because they are charged, we can steer them into circular storage rings, and keep them going round and round at speeds exceedingly close to the speed of light, say 0.995 c. In experiments at laboratories in both Europe and the United States, such muons have been found to survive typically for 30 times the 2.2 microsecond lifetime before decaying, in very good numerical agreement with the predictions of Special Relativity. The muons going around the accelerator are like clock B in Einstein's theorem, and a stationary muon in the laboratory would be the equivalent of clock A.
We may therefore conclude from such experimental observations that, insofar as the inanimate muons are concerned, the Twin Paradox is valid, and that to an observer at rest on Earth, travelling muons remain truly younger than their stationary brethren." …… "Relativity forces us to take a different view of time, a view that does not correspond to our everyday experience."

WHY DOES THE TWIN PARADOX EXIST?

In 1977, when I was 22 years old, I arrived at these conclusions:
The Twin Paradox has existed because, rather than the twins' motions being relative to each other, all should be relative to an imaginary observer at the centre-of-mass of the system. If the system consists of the twins only, the twins age the same amount relative to an ineffectual observer at the centre-of-mass of their binary system. For an imaginary observer at the centre-of-mass of a multi-massed system, limited physics equations should be modified to become more universal. The velocity-of-light is a variable velocity for each point relative to that observer at the centre-of-mass. The velocity-of-light is different at the centre-of-masses of different particles relative to that observer.
I rewrite Einstein's $Mc^2 = M_oc^2(c^2 - v^2)^{-1/2}$. Further, I use 'i' to show that it is a pertaining to the i^{th} particle. Now, M_{io} is the mass of the i^{th} particle when its velocity is zero, and c_{io} is the velocity-of-light when the i^{th} particle has a velocity of zero.

For a multi-massed system, if we initially consider the velocity-of-light to be constant, and if we consider the masses to be invariable,

$\delta [\sum (M_i v_i)] = 0.$

When that is true, the following is also true.

$\delta [\{\sum (M_i v_i)\}^2] = 0.$

INTRODUCING REVERSIBLE & IRREVERSIBLE THEORIES

More and more, physicists realize that not all of Einstein's assumptions and properties in SR physics are correct. Because $c^2t^2 = c^2(-t)^2$, it is obvious that Einstein assumed that events are reversible with time as he created Special Relativity. As I write this paper, I use Albert Einstein's reversibility of events with time for my REVERSIBLE THEORY. Also in this paper, I introduce possible irreversibility of events with time in my IRREVERSIBLE THEORY. Decide whether you prefer REVERSIBLE or IRREVERSIBLE.

Not all observers experience light's velocity as the same constant c, because they experience light's velocity to be variable. Rainbows occur because light-rays of different wavelengths travels at different velocities. Whether variable or constant, the speed of light is the upper limit to the relative velocity between two inertial frames. Although, in SR, a Lorentz transformation relates any two inertial frames, the Lorentz transformation needs to be changed for a different number of dimensional co-ordinates.

Einstein's Concept of Simplicity seems to be a joke, and is inappropriate in theoretical physics, because no 6-year-old child can understand difficult mathematical concepts that were espoused by Einstein himself, especially his theory of General Relativity. If anything, the Concept of Simplicity is an invalid justification for the equation of mass-energy equivalence.

In ENTANGLEMENT EXISTS , contraction of length, dilation of time, equivalence of mass and energy, relativistic mass, relativity of simultaneity, and an upper limit of universal velocity can be explained by another theory that develops from the four dimensions of SR.

The Minkowski diagram is appropriate to illustrate the properties of space and time in this new theory of four dimensions. What should be pointed out is that the dimension of (time by speed-of-light) should never have been considered the dimension of (time); this is more significant when the speed-of-light is a variable. Although SR space is theorized to consist of four mutually orthogonal vectors $\{e_0,e_1,e_2,e_3\}$ so they mathematically follow $-(e_0)^2 = (e_1)^2 = (e_2)^2 = (e_3)^2 = 1$. This mathematical concept is used in ENTANGLEMENT EXISTS .

Relativists use the matrix $\eta = \begin{pmatrix} -1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$ **. In SR, for any large multi-particle object, relativists believe that the total kinetic energy equals the summation of the kinetic energies of all particles within the object, but this belief is not true; kinetic energy is an incorrect concept that seems to apply to some situations.**

It is untrue when the law of *conservation of energy* states that, for conservative forces, constancy of total energy, $\sum E = E_{\mathrm{k}} + E_{\mathrm{p}}$, in time exists; energy is not the best concept to use, and conservation of energy is incorrect.
Maxwell's differential equations are not totally accurate, universal laws, so the equations can be improved. When SR is replaced by the more successful Grand Einstein/Rodgers Theory for fast-moving objects or particles, the equations of the more advanced quantum electrodynamics theory can be appropriately replaced or modified.
To find the proposed "constant speed-of-light" for SR, Einstein used Maxwell's equations that include universal constants that are permittivity of free space = ε_0 , and permeability of free space = μ_0 . The truth of reality is that permittivity, permeability, and speed-of-light are all variables. When Einstein wrote, "Gradually, I despaired of the possibility of discovering the true laws by means of constructive efforts based on known facts," he disclosed that some of his assumptions used to create SR are possibly incorrect.
If the universal constant c is exactly 299,792,458 meters per second, because the length of the meter is defined from this constant and the international standard for time, the velocity of light is not definitely constant; this is a fabrication by physicists to make the velocity of light seem constant; in truth, the velocity of light is a variable.

REVERSIBLE THEORY OF PHYSICS

Maxwell's Equations have been extremely important in physics because the four equations are considered to be the basic equations for much of mathematical physics, so undergraduate students learn these equations to pass examinations, although most physicists have not analyzed Maxwell's Equations deeply. I realized that these equations needed to be improved and did not effectively predict some occurrences in physics, like variable velocity of light, and did not unify the fields of physics.
By modifying Maxwell's Equations and adding three equations, I suggested the seven new Equations I→VII for particle 'a' affected by particle 'b', after I struggled with the original equations for a very long time to derive these new equations because the mathematics of the universe is not simple, but is consistently symmetrical. My new Rodgers/Maxwell's equations are initially similar to Maxwell's equations, but relate particle 'a' to particle 'b' in a multi-massed universe where everything relates to everything else because that is how the universe is.
I did not change Maxwell's I and IV equations very much and merely needed to stress that the equations are about a relationship between two particles, so even time is for each of the specific particles. I changed Maxwell's II and III equations much more because the unification of Coulomb and gravitational fields is very important in these equations and is a major goal in developing a successful UFT, a unifying field of theoretical physics. My equations I and II were developed very meticulously to mathematically explain forces when particles are extremely close because two electrons or two protons attract each other when extremely close and protons and electrons repel each other when extremely close.

The permittivity needs to be variable to cause the velocity of light to be variable because the velocity of light definitely is variable after research has shown that light moves at different velocities through different mediums, and that the velocity of light has changed since the Big Bang. Equations V, VI and VII are necessary inclusions that provide elaborate formulations for better comprehension of time and radius.

Lorentz transformations are appropriate for SR, but must be modified for the REVERSIBLE theory for fast-moving objects or particles. In REVERSIBLE, an "event" is a 4-co-ordinate reference point in space like

$\underline{s}$ = [x, y, z, ict]. Note: i = $(-1)^{1/2}$; and c is a variable or constant.

The twin paradox necessitates a change to the concept of the observer by placing the observer at the centre-of-mass of the entire system because nothing is entirely isolated in this universe where closely and distantly separated particles all always interact.

The SR prediction of mass-energy equivalence, e = mc^2, can be further refined.

For REVERSIBLE THEORY, physicists use an equation similar to momentum conservation when a collision occurs. The relativistic energy-momentum equation for a particle or a photon, $E^2 - (pc)^2 = (mc^2)^2$, where *m* is the rest mass, is not always valid in REVERSIBLE THEORY because this revolutionary theory is far less restrictive. Einstein stated that both energy and momentum conservation laws apply in SR, but these laws need to be re-evaluated because energy and momentum are human intellectual constructions that are approximations for certain situations and are incorrect for other situations.

Attempts to combine GR and Quantum Theory have failed because GR may be further refined, because GR is based on SR which may be further refined, mostly because the basic dimensional co-ordinates of SR may be refined (specifically the 4^{th} dimension) and because the belief that speed of light is constant is incorrect.

To improve the Dirac wave equation, physicists need to use the new 4-dimensional geometry of REVERSIBLE THEORY rather than the 4-dimensional geometry of SR. By using this new 4-dimensional geometry instead of SR's old 4-dimensional geometry, physicists can improve what is now relativistic QM to create a better theory of particle interactions; my REVERSIBLE THEORY is an extremely good analysis of particle interactions in a multi-massed system.

The accepted fact that the electromagnetic field and the gravitational field are the only two fields with infinite range suggests that the two fields result from one field that could be called the gravitational-electromagnetic field that, conceptually, is simplification of physics so a programmed computer could solve very complicated situations rather simply, and more simply than before REVERSIBLE THEORY.

Although SR is a very important part of all modern physics theories, including quantum field theory and string theory, SR, in many situations, is approximate. The 4-dimensional REVERSIBLE THEORY will substitute for SR.

REVERSIBLE EVENTS WITH TIME

Note that, in this equation, the velocity of light can be a variable, like I have believed for 44 years, or a constant like Albert Einstein believed. This equation implies that events are reversible with time. From a four-dimensional co-ordinate system,

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + ict\underline{e}_4$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2$$

This gives the same answer for t as for (-t). That means that events are reversible with time. Similarly for the following equations.

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + ict\underline{e}_4 + i\lambda\underline{e}_5$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2 - (\lambda)^2$$

$$\underline{s} = x_1\underline{e}_1 + x_2\underline{e}_2 + x_3\underline{e}_3 + i(ct + \lambda)\underline{e}_4$$

$$\text{so that } \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct + \lambda)^2$$

$$= \underline{s}.\underline{s} = (x_1)^2 + (x_2)^2 + (x_3)^2 - (c + h/mx)^2t^2$$

[Note that $\lambda = h/mv = ht/mx$.]

IRREVERSIBLE EVENTS WITH TIME

Einstein's equation implies that events are reversible with time. A major problem is that most people believe that events are irreversible with time. Also believing that events are irreversible with time, I have strived to create an alternative equation.

The most appropriate geometrical equation is the following.

$$\underline{s} = (x_i + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})\underline{e}_1 + (x_i + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})\underline{e}_2 + (x_i + i(c\alpha_a\phi_a\xi_a\ t)/3^{1/2})\underline{e}_3$$

$\ldots\sum$ **for** $j=1\searrow 3$. **Note that c can be variable or constant and there are only three dimensions, but they are peculiar. For these geometries, events are irreversible with time.**

$$\underline{s}.\underline{s} = (x_1 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2 + (x_2 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2 + (x_3 + i(ct\alpha_a\phi_a\xi_a)/3^{1/2})^2$$

$$= (x_1)^2 + (x_2)^2 + (x_3)^2 + 2(x_1+x_2+x_3)i(ct\alpha_a\phi_a\xi_a)/3^{1/2} - (ct\alpha_a\phi_a\xi_a)^2 .$$

This gives different answers for t and for (-t). That means that events are irreversible with time. The UNIVERSAL CONSERVATION EQUATION FOR IRREVERSIBLE EVENTS WITH TIME will be different from the previous UNIVERSAL CONSERVATION EQUATION.

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When variable or constant velocity-of-light exists for each of the particles in the multi-massed system, the equation must be improved because, as I have previously stated, for prediction of irreversibility of events with time in this real universe, and to lead to the correct bending of light by a large gravitational Mass in Schwarzschild's equation, $(ds)^2$ must contain a change-in-time element that is not squared. Surprising me, the best solution is an application of my revolutionary, three-dimensional mathematics.

$$(\delta\ \underline{s}).(\delta\ \underline{s}) = (\delta\ s)^2 = (\delta\ x)^2 + (\delta\ y)^2 + (\delta\ z)^2 + 2j/3^{1/2}(\delta\ (ct))(\delta\ x + \delta\ y + \delta\ z) - (\delta\ (ct))^2 .$$

For a single mass, my 3D equation is

$$\delta\ [(M\ \delta\ \underline{s}).(M\ \delta\ \underline{s})] = \delta\ [M^2(\delta\ s)^2] =$$

$$\delta\ [M^2(\delta\ x + j\ \delta\ (ct)/3^{1/2})^2]$$

$$+ \delta\ [M^2(\delta\ y + j\ \delta\ (ct)/3^{1/2})^2]$$

$$+ \delta\ [M^2(\delta\ z + j\ \delta\ (ct)/3^{1/2})^2]$$

$= 0$.

For a multi-massed system, with i = 1 to N, my 3D equation is

$$\delta [(\sum (M_i \delta \underline{s}_i)).(\sum (M_i \delta \underline{s}_i))] = \delta [(\sum (M_i \delta s_i))^2] =$$
$$\delta [\sum M_i (\delta x_i + j \delta (c_i t_i)/3^{1/2})]^2$$
$$+ \delta [\sum M_i (\delta y_i + j \delta (c_i t_i)/3^{1/2})]^2$$
$$+ \delta [\sum M_i (\delta z_i + j \delta (c_i t_i)/3^{1/2})]^2$$
$$= 0 .$$

<Note that: i = 1 to N; j = the square root of -1; and c_i is a variable velocity-of-light.>

To consider the time element for a single mass, I write the single-mass equation as the following.

$$\delta [(M \delta \underline{s}).(M \delta \underline{s})] = \delta [M^2 (\delta s)^2] =$$
$$\delta [M^2 (\delta x + j \delta (ct)/3^{1/2})^2]$$
$$+ \delta [M^2 (\delta y + j \delta (ct)/3^{1/2})^2]$$
$$+ \delta [M^2 (\delta z + j \delta (ct)/3^{1/2})^2]$$
$$=$$
$$\delta [M^2 [(\delta x)^2 + j\, 2(\delta x)(\delta (ct/3^{1/2})) - (\delta (ct/3^{1/2}))^2]]$$
$$+ \delta [M^2 [(\delta y)^2 + j\, 2(\delta y)(\delta (ct/3^{1/2})) - (\delta (ct/3^{1/2}))^2]]$$
$$+ \delta [M^2 [(\delta z)^2 + j\, 2(\delta z)(\delta (ct/3^{1/2})) - (\delta (ct/3^{1/2}))^2]]$$
$$= 0 .$$

If t is replaced by (-t), the other variables must be changed in the equation. Therefore, by using my newly-proposed three-dimensional geometry, we discover that this universe can consist of events irreversible with time.

Of course, as I have revealed in my BAER, theoretical physics consists of many more influences. Even so, these newly-proposed modifications to basic spatial geometry and the equation for a single-massed system are significant and sufficient to provide an explanation for our real universe's irreversibility. Further, my modifications to theoretical physics indicate that a time-machine is impossible.

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MAXWELL'S EQUATIONS ARE INCORRECT

Unfortunately, Maxwell's Equations are not fully correct because:

- **Maxwell's Equations do not apply to a multi-particled system of charged particles.**
- **Maxwell's Equations do not use the centre-of-mass of the entire system as the reference point for distances involved in the equations.**
- **Maxwell's Equations do not include variables μ and ε, rather than the constants μ_o and ε_o, although it is known that permeability and permittivity are variables.**
- **Maxwell's Equations do not predict a variable velocity-of-light, although the photon does move at different velocities, and the velocity-of-light has changed during history.**
- **Maxwell's Equations do not include separate equations for each of particle a and particle b .**
- **$(\delta S_{ij})^2 = \delta \underline{S}_{ij} . \delta \underline{S}_{ij} = \delta(\underline{S}_j - \underline{S}_i). \delta(\underline{S}_j - \underline{S}_i)$ …. and …. $(\delta S_{ji})^2 = \delta \underline{S}_{ji} . \delta \underline{S}_{ji}$**

= δ($\underline{S}_i - \underline{S}_j$). δ($\underline{S}_i - \underline{S}_j$) need to be introduced into Maxwell's Equations.

- **Maxwell's Equations do not include the gravitational components as in Schwarzschild's equation to predict gravitational bending of the space-time continuum.**
- **Maxwell's Equations do not explain particles with similar charges attracting each other when at very small distance apart.**
- **Maxwell's Equations do not include different times for different charged particles.**
- **Maxwell's Equations do not include the fully correct r_{ij} between the particles.**
- **Maxwell's Equations do not explain why mass, like energy, is variable with charge.**

WAVE/PARTICLE DUALITY OF THE PHOTON

In 'RELATIVITY The Special And The General Theory', p157, Albert Einstein wrote:
"In conformity with the present form of the quantum theory, it (the present-day generation of physicists) believes that the state of a system cannot be specified directly, but only in an indirect way by a statement of the statistics of the results of measurement attainable on the system. The conviction prevails that the experimentally assured duality of nature (corpuscular and wave structure) can be realised only by such a weakening of the concept of reality. I think that such a far-reaching theoretical renunciation is not for the present justified by our actual knowledge, and that one should not desist from pursuing to the end the path of the relativistic field theory."

In 'RELATIVITY The Special And The General Theory', p145, Albert Einstein wrote:
"In accordance with the historical development of the field concept, where no matter was available there could also exist no field. But in the first quarter of the nineteenth century it was shown that the phenomena of the interference and motion of light could be explained with astonishing clearness when light was regarded as a wave-field, completely analogous to the mechanical vibration field in an elastic solid body. It was thus felt necessary to introduce a field, that could also exist in 'empty space' in the absence of ponderable matter."

In 'RELATIVITY The Special And The General Theory', p146, Albert Einstein wrote:
"By the introduction of the field concept in electrodynamics, Maxwell succeeded in predicting the existence of electromagnetic waves, the essential identity of which with light waves could not be doubted, because of the equality of their velocity of propagation."

In 'RELATIVITY The Special And The General Theory', p49, Albert Einstein wrote:
"The special theory of relativity has crystallised out from the Maxwell-Lorentz theory of electromagnetic phenomena."

In 'RELATIVITY The Special And The General Theory', p63, Albert Einstein wrote:
"As the result of the more careful study of electromagnetic phenomena, we have come to regard action at a distance as a process impossible without the intervention of some intermediary medium."…. "We shall only mention that with its (an intermediary medium's) aid electromagnetic phenomena can be theoretically represented much more satisfactorily than without it, and this applies particularly to the transmission of electromagnetic waves."

Sir Isaac Newton's corpuscular theory of light is that light is made up of small discrete particles called "corpuscles". In 1924, Louis de Broglie suggested that if light has a dual, wave-particle nature, perhaps matter has also. Louis de Broglie assumed that the wavelength of the predicted matter waves was given by the same relationship that held for light:

$\lambda = {}^{h}/_{\rho} = {}^{h}/_{Mv}$.

If I consider the energy level,

$\lambda = {}^{nh}/_{\rho} = {}^{nh}/_{Mv}$.

The contemporary theory of Photons explains the photoelectric effect, but fails to explain other effects, such as interference and diffraction. To explain these effects, physicists created the wave theory of light, then electromagnetism, and then modern quantum mechanics and the wave–particle duality of the photon.

QUANTUM ASPECTS

So far in this physics paper, my equations are not sufficient because they do not include waves, but waves definitely exist and must be included. Therefore, I introduce quantum aspects.

$$(M\underline{s}) =$$
$$(Mx + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_1$$
$$+ (My + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_2$$
$$+ (Mz + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_3 .$$

In polar co-ordinates, it becomes as below.

$$(M\underline{s}) =$$
$$(Mr\sin\Omega \sin\theta + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_1$$
$$+ (Mr\cos\Omega \sin\theta + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_2$$
$$+ (Mr\cos\theta + j(Mc + nh\lambda^{-1})(t)/3^{1/2})\underline{e}_3 .$$

For a multi-massed system, I derive the equation that follows.

$$\delta [(\sum (\delta (M_i\underline{s}_i))). (\sum (\delta (M_i\underline{s}_i)))] = \delta [[\sum (\delta (M_i s_i))]^2] =$$
$$\delta [[\sum \delta \{ M_i x_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$+ \delta [[\sum \delta \{ M_i y_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$+ \delta [[\sum \delta \{ M_i z_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$= 0 .$$

In bipolar co-ordinates, this can be as the equation below.

$$\delta [(\sum (\delta (M_i\underline{s}_i))). (\sum (\delta (M_i\underline{s}_i)))] = \delta [[\sum (\delta (M_i s_i))]^2] =$$
$$\delta [[\sum \delta \{ M_i r_i\sin\Omega_i \sin\theta_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$+ \delta [[\sum \delta \{ M_i r_i\cos\Omega_i \sin\theta_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$+ \delta [[\sum \delta \{ M_i r_i\cos\theta_i + j (M_i c_i + n_i h\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$=$$
$$\delta [\sum \{ (\delta(M_i r_i\sin\Omega_i \sin\theta_i))^2 + (\delta(M_i r_i\cos\Omega_i \sin\theta_i))^2 + (\delta(M_i r_i\cos\theta_i))^2$$
$$+ 2j/3^{1/2}(\delta(M_i(c_i + n_i h\lambda_i^{-1}M_i^{-1})(t_i))) (\delta(M_i r_i\sin\Omega_i \sin\theta_i))$$
$$+ 2j/3^{1/2}(\delta (M_i(c_i + n_i h\lambda_i^{-1}M_i^{-1})(t_i))) (\delta(M_i r_i\cos\Omega_i \sin\theta_i))$$
$$+ 2j/3^{1/2}(\delta (M_i(c_i + n_i h\lambda_i^{-1}M_i^{-1})(t_i))) (\delta(M_i r_i\cos\theta_i))$$
$$- (\delta (M_i(c_i + n_i h\lambda_i^{-1})(t_i)))^2 \}]$$
$$= 0 .$$

COULOMB EFFECTS

In this section, we consider two particles, particle i with mass M_i and a charge Q_i , and particle j with mass M_j and a charge Q_j. They have a radial distance r_{ij} between their individual centre-of-masses, and are each, respectively, r_i and r_j from the entire two-mass system's centre-of-mass. Assume that

$R_{ij} > (R_i + R_j)$ where R_i is the radius of particle i, and R_j is the radius of particle j, where both are usually different from r_i and r_j. A minus sign indicates an attractive force that pulls the particles together.

For the special situation in which uniform circular motion occurs,

$F_i = - M_i v_i^2/r_i = Q_iQ_j/(4\pi\varepsilon_o r_{ij}^2)$ for particle i ;

and $F_j = - M_j v_j^2/r_j = Q_iQ_j/(4\pi\varepsilon_o r_{ij}^2)$ for particle j, where v_i and v_j are relative to the centre-of-mass of the entire system. Coulomb influences affect mass and energy. Magnetic effects are relativistic Coulomb effects due to charges moving.

RELATIVISTIC EFFECT ON COULOMB FORCE

Referring to electromagnetism and the weak nuclear force, Michael D. Lemonick wrote, "It finally happened in 1983, in the proton-antiproton collider at CERN, the European centre for Particle Physics. The discovery of the W+, W- and Z proved that two forces, at least, are indistinguishable at high enough energies."

THIS INDICATES THAT A RELATIVISTIC EFFECT ON THE COULOMB FORCE EXISTS.

MASS VARIABLE WITH CHARGE

In "Einstein's Theory of Relativity" by Max Born, on page 287, he stated that there are three kinds of π-mesons (π^+, π^- and π^0-mesons) and exact measurements of their masses have revealed π^+ and π^- are equal in mass and 273 times the mass of an electron- while π^0 is only 264 times that of an electron. This mass-difference is due to charge.

To relate these facts, the applicable equation is

$(M\pm - M_0)c^2 = e^2(8\pi\varepsilon_o r)^{-1}$

(where $M\pm$ = mass of a charged π-meson, and M_0 = mass of a non-charged π-meson). The above equation , for the π-meson, reveals that mass, like energy, is variable with charge.

GRAVITATIONAL EFFECTS

- **The gravitational force F, acting on the particle, assuming $r_{ib} > (R_i + R_j)$, is $(– GM_iM_jr_{ij}^{-2})$ with the minus sign indicating an attractive force that pulls the particles together.**
- **Gravitational potential energy $U = – \zeta F(r_{ij}). \delta r_{ij} = –\zeta (– GM_iM_jr_{ij}^{-2}). \delta r_{ij}$**

$= [- GM_iM_jr_{ij}^{-1} + GM_iM_j\infty^{-1}] = - GM_iM_jr_{ij}^{-1}$.

- Overall energy $E = M_ic^2 + M_jc^2 - GM_iM_jr_{ij}^{-1}$.
- Therefore, $E = (M_{io}c^2)(1 - v_i^2c^{-2})^{-1/2} + (M_{io}c^2)(1 - v_i^2c^{-2})^{-1/2} - GM_iM_jr_{ij}^{-1}$.
- If there has been no loss of energy from the system,
  $E = (M_{io}c^2) + (M_{jo}c^2) = (M_{io}c^2)(1 - v_i^2c^{-2})^{-1/2} + (M_{jo}c^2)(1 - v_j^2c^{-2})^{-1/2} - GM_iM_jr_{ij}^{-1}$
  $= ((M_{io}c^2)(1 - v_i^2c^{-2})^{-1/2} - GM_iM_jr_ir_{ij}^{-2}) + ((M_{jo}c^2)(1 - v_j^2c^{-2})^{-1/2} - GM_iM_jr_jr_{ij}^{-2})$.
- Therefore, classically, if the velocities are small when compared with the velocity-of-light,
  $^1/2M_{io}v_i^2 + {}^1/2M_{jo}v_j^2 \approx GM_iM_jr_{ij}^{-1}$.

THE PRINCIPLE OF EQUIVALENCE

In 'RELATIVITY The Special And The General Theory', p154, Albert Einstein wrote: "According to the principle of equivalence, $\delta s^2 = g_{ik}\,\delta x_i\delta x_k$ describes in general covariant form a gravitational field of a special kind, when the functions g_{ik} satisfy the Riemann condition.
It follows that the law for the pure gravitational field of a general kind must be satisfied when the Riemann condition is satisfied; but it must be weaker or less restricting than the Riemann condition. In this way, the field law of pure gravitation is practically completely determined."

THE SCHWARZSCHILD SOLUTION

The Schwarzschild solution describes the gravitational field outside a spherical, non-rotating mass such as a star, a planet or a black hole. It is also a good approximation to the gravitational field of a slowly rotating body like the Earth or Sun.

SCHWARZSCHILD'S EQUATION

- As a solution to general relativity's implications, Schwarzschild, for a light-ray passing a mass, created the equation
  $-(\delta s)^2 = c^2(\delta t)^2(1 - 2GMr^{-1}c^{-2}) - (\delta r)^2(1 - 2GMr^{-1}c^{-2})^{-1} - r^2(\sin^2\theta\,(\delta\Omega)^2 + (\delta\theta)^2)$.
- This equation accounts for the time dilation in a gravitational field. Clocks go slower when closer to a mass, because change in time is less. That produces gravitational red-shift. Light leaving a region where gravity is strong reddens. This also accounts for the deflection of a light-ray passing the sun during a solar eclipse of a star. But, this mathematics is simplistic because it does not consider the binary masses as both moving around the system's centre-of-mass.

WHY REVERSAL EFFECTS OCCUR DUE TO CHARGES AT SHORT DISTANCES APART?

EQUATION (repeated):

$$\delta\,[(\sum(\delta(M_i\underline{s}_i))).(\sum(\delta(M_i\underline{s}_i)))] = \delta\,[[\sum(\delta(M_is_i))]^2] =$$
$$\delta\,[[\sum\delta\{M_i\,r_i\sin\Omega_i\,\sin\theta_i + j(M_i\,c_i + n_ih\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$
$$+\,\delta\,[[\sum\delta\{M_i\,r_i\cos\Omega_i\,\sin\theta_i + j(M_i\,c_i + n_ih\lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$$

$+ \delta [[\sum \delta \{ M_i r_i \cos\theta_i + j (M_i c_i + n_i h \lambda_i^{-1})(t_i)/3^{1/2}\}]^2]$
$= 0$.

Appropriate mathematics would explain why attractive interactions becoming repulsive, and why repulsive interactions becoming attractive, at short radii if (δt_i) and (δr_i) are modified.

Light-rays are bent by a charge.

Below, I unify Coulomb and gravitational interactions by introducing variable permittivity ε_{ij}. I improve Schwarzschild's equations for (δt_i) and (δr_i) so they produce reversals in effects of gravity and charge interactions at very short distances.

$(\delta t_i) = (\delta t)[1 - Q_i Q_i (4\pi\varepsilon_{ij})^{-1} M_i^{-1} r_i r_{ij}^{-2} c_i^{-2}]^{-1} = (\delta t)[1 - (Q_i Q_i (4\pi\varepsilon_0)^{-1} + G M_i M_i) M_i^{-1} r_i r_{ij}^{-2} c_i^{-2}]^{-1}.$

$(\delta r_i) = (\delta r)[1 - Q_i Q_i (4\pi\varepsilon_{ij})^{-1} M_i^{-1} r_i r_{ij}^{-2} c_i^{-2}]$

$= (\delta r)[1 - (Q_i Q_i (4\pi\varepsilon_0)^{-1} + G M_i M_i) M_i^{-1} r_i r_{ij}^{-2} c_i^{-2}].$

$\varepsilon_{ij}^{-1} = (\varepsilon_o^{-1} - 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}).$

I introduce a variable permeability equation so

$\mu_{ij}^{-1} = (\mu_o^{-1} + K_{ij})$

where K_{ij} is an unknown variable formula.

Then, (the velocity-of-light at the centre of particle i)^2 is as follows.

c_i^2

$= \mu_{ij}^{-1} \varepsilon_{ij}^{-1}$

$= (\mu_o^{-1} + K_{ij})(\varepsilon_o^{-1} - 4\pi G M_i M_j Q_i^{-1} Q_j^{-1})$

$= (\mu_o^{-1} + K_{ij})\varepsilon_o^{-1} - (\mu_o^{-1} + K_{ij}) 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}$

$= \mu_o^{-1}\varepsilon_o^{-1} + K_{ij}\varepsilon_o^{-1} - \mu_o^{-1} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1} + K_{ij} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}$

$= c^2 + K_{ij}\varepsilon_o^{-1} - \mu_o^{-1} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1} + K_{ij} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}$

$= c^2 + K_{ij}\varepsilon_o^{-1} - 4\pi\varepsilon_o c^2 G M_i M_j Q_i^{-1} Q_j^{-1} + K_{ij} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}.$

In the special case where K_{ij} is approximately equal to zero,

(the velocity of light at the centre of particle i)^2 is as follows.

$c_i^2 = c^2 - \mu_o^{-1} 4\pi G M_i M_j Q_i^{-1} Q_j^{-1}$ **approximately.**

Therefore, since $c^2 = \mu_o^{-1}\varepsilon_o^{-1}$,

$c_i^2 = c^2(1 - 4\pi\varepsilon_o G M_i M_j Q_i^{-1} Q_j^{-1})$ **approximately.**

This is more likely to be $c_i^2 = c^2(1 - 2\pi\varepsilon_o G M_i M_j Q_i^{-1} Q_j^{-1})^2$

So that $c_i^2 = c^2(1 - 4\pi\varepsilon_o G M_i M_j Q_i^{-1} Q_j^{-1} + 4\pi^2 \varepsilon_o^2 G^2 M_i^2 M_j^2 Q_i^{-2} Q_j^{-2})$.

After many thousands of hours at scribbling possible equations on many thousands of sheets of paper, and ripping them up, I arrived at a revelatory conclusion:

Everything existing in this universe, including photons, sub-atomic particles, massive suns, and humans, consists of wave-particles of the same formula, and is a manifestation of electromagnetic waves commonly called light.

MAXWELL-RODGERS EQUATIONS

Maxwell's Equations are not fully correct for many reasons. Appropriate mathematics would explain why attractive interactions become repulsive, and why repulsive interactions become attractive, at short radii if (δt_a) and (δr_a) are modified. Light-rays are bent by gravity, but light-rays are also bent by a charge. Below, I unify Coulomb and gravitational interactions by introducing variable permittivity ε_{ab}. I improve Schwarzschild's equations for (δt_a) and (δr_a) so they produce reversals in effects of gravity and charge interactions at very short distances.

By modifying Maxwell's Equations and adding four equations, I suggest the eight new MAXWELL-RODGERS Equations I→VIII for particle a.

EQUATION I:

$$\int \mathbf{B}_a \,.\, \delta \mathbf{A}_{ab} = 0.$$

EQUATION II:

$$\int \mathbf{E}_a \,.\, \delta \mathbf{A}_{ab} = \delta \{Q_a Q_b \varepsilon_{ab}^{-1} - (1/4)\, Q_a^2 Q_b^2 \varepsilon_{ab}^{-2})\} / \delta Q_b$$

$$= \delta\{(Q_a Q_b \varepsilon_o^{-1} - 4\pi G M_a M_b) - (1/4)\,(Q_a Q_b \varepsilon_o^{-1} - 4\pi G M_a M_b)^2)\}/\delta Q_b.$$

EQUATION III:

$$\int \mathbf{B}_i \,.\, \delta \mathbf{l}_{ij} = \mu(I_a + \varepsilon \delta \Phi_{Ea}\, \delta t_a^{-1})$$

$$= \mu(I_a + \{\varepsilon_o^{-1} - 4\pi G M_a M_b Q_a^{-1} Q_b^{-1} - (1/4) Q_a Q_b \varepsilon_o^{-2} + \varepsilon_o^{-1} \pi G M_a M_b - 4\pi^2 G^2 M_a^2 M_b^2 Q_a^{-1} Q_b^{-1}\}\, \delta \Phi_{Ea} \delta t_a^{-1}).$$

EQUATION IV:

$$\int \mathbf{E}_a \,.\, \Delta \mathbf{l}_{ab} = -\, \delta \Phi_{Ba}\, (\delta t_b)^{-1}.$$

EXTRA EQUATION V:

$$(\delta t_a)^2 = (\delta t)^2 [1 - Q_a Q_b (4\pi \varepsilon_{ab})^{-1} (M_a)^{-1} r_a r_{ab}^{-2} c_a^{-2}]^{-2} = (\delta t)^2 \gamma_a^{-2}.$$

EXTRA EQUATION VI:

$$(\delta r_a)^2 = (\delta r)^2 [1 - Q_a Q_b (4\pi \varepsilon_{ab})^{-1} (M_a)^{-1} r_a r_{ab}^{-2} c_a^{-2}]^2 = (\delta r)^2 \gamma_a^{\,2}.$$

EXTRA EQUATION VII:

$$\varepsilon_{ab}^{-1} = (\varepsilon_0^{-1} - 4\pi G\, M_a M_b Q_a^{-1} Q_b^{-1}).$$

EXTRA EQUATION VIII:

$$M_a = \rho_a V_a \quad \& \quad M_b = \rho_b V_b$$

REFINEMENTS TO MAXWELL'S EQUATIONS:

1. **apply to a multi-particled system of charged particles.**
2. **use the centre-of-mass of the entire system as the reference point for distances involved in the equations.**
3. **include variables μ and ε rather than the constants μ_o and ε_o, because it is known that permeability and permittivity are variable.**
4. **predict a variable velocity-of-light that accords with the photon moving at different velocities, and the velocity-of-light changing during history.**
5. **include separate equations for each of particle a& particle b.**
6. **use $(\delta S_{ab})^2 = \delta S_{ab} \,.\, \delta S_{ab} = \delta(\, S_b - S_a).\, \delta(\, S_b - S_a)$ & $(\delta S_{ba})^2 = \delta S_{ba} \,.\, \delta S_{ba} = \delta(\, S_a - S_b).\, \delta(\, S_a - S_b).$**
7. **include the gravitational components as in Schwarzschild's equation to predict gravitational bending of the space-time continuum.**
8. **mathematically explain why particles with similar charges attract each other when at very short distances apart.**
9. **include different times for different charged particles.**
10. **include the fully correct r_{ab} between the particles.**
11. **mathematically explain why mass, like energy, is variable with charge.**

<u>RODGERS'S EQUATIONS ARE MORE CORRECT BECAUSE</u>:

- **Rodgers's Equations apply to a multi-particled system of charged particles.**
- **Rodgers's Equations use the centre-of-mass of the entire system as the reference point for distances involved in the equations.**
- **Rodgers's Equations include variables μ and ε rather than the constants μ_o and ε_o, because it is known that permeability and permittivity are variable.**
- **Rodgers's Equations predict a variable velocity-of-light that accords with the photon moving at different velocities, and the velocity-of-light changing during history.**
- **Rodgers's Equations include separate equations for each of particle i & particle j .**
- **$(\delta S_{ij})^2 = \delta \underline{S}_{ij} \,.\, \delta \underline{S}_{ij} = \delta(\, \underline{S}_j - \underline{S}_i).\, \delta(\, \underline{S}_j - \underline{S}_i)$ …. and …. $(\delta S_{ji})^2 = \delta \underline{S}_{ji} \,.\, \delta \underline{S}_{ji}$ $= \delta(\, \underline{S}_i - \underline{S}_j).\, \delta(\, \underline{S}_i - \underline{S}_j)$ are used in Rodgers's Equations.**
- **Rodgers's Equations include the gravititional components as in Schwarzschild's equation to predict gravitational bending of the space-time continuum.**
- **Rodgers's Equations mathematically explain why particles with similar charges attract each other when at very short distances apart.**
- **Rodgers's Equations include different times for different charged particles.**
- **Rodgers's Equations include the fully correct r_{ij} between the particles.**
- **Rodgers's Equations mathematically explain why mass, like energy, is variable with charge.**

SINUSOIDAL ELECTROMAGNETIC WAVES

Physicists often represent the electromagnetic wave propagated in the x-direction as having two component sinusoidal waves that are perpendicular to each other:

$E_{(x,t)} = E_{max} \sin(\omega t - kx)$

and

$B_{(x,t)} = B_{max} \sin(\omega t - kx)$.

But $\omega = 2\Pi f = 2\Pi c\lambda^{-1}$ **and** $k = 2\Pi\lambda^{-1}$.

Putting these into the top equations,

$E = E_{max} \sin(2\Pi\lambda^{-1}ct - 2\Pi\lambda^{-1}x)$

and

$B = B_{max} \sin(2\Pi\lambda^{-1}ct - 2\Pi\lambda^{-1}x)$.

This is better represented as:

$E = E_{max} \sin(2\Pi\lambda^{-1}(ct - x)$

And $B = B_{max} \sin(2\Pi\lambda^{-1}(ct - x)$.

For that simple system, physicists found that

$(\delta^2 E)/(c^2(\delta t)^2) = (\delta^2 E)/(\delta x)^2$ **and** $(\delta^2 B)/(c^2(\delta t)^2) = (\delta^2 B)/(\delta x)^2$.

For a four-dimensional system, and constant velocity of light, as Albert Einstein proposed, physicists found that

$(\delta^2 E)/(c^2(\delta t)^2) = (\delta^2 E)/(\delta x)^2 + (\delta^2 E)/(\delta y)^2 + (\delta^2 E)/(\delta z)^2$

and

$(\delta^2 B)/(c^2(\delta t)^2) = (\delta^2 B)/(\delta x)^2 + (\delta^2 B)/(\delta y)^2 + (\delta^2 B)/(\delta z)^2$.

But these equations are inappropriate because our universe does not follow Albert Einstein's four-dimensional mathematics and the velocity-of-light is not a constant. Instead, our universe follows three-dimensional mathematics that has peculiarities.

$$(\underline{s}) = (x + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})\underline{e}_1 + (y + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})\underline{e}_2 + (z + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})\underline{e}_3 .$$

$$E = E_{max} \sin[2\Pi\lambda^{-1}(x + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + E_{max} \sin[2\Pi\lambda^{-1}(y + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + E_{max} \sin[2\Pi\lambda^{-1}(z + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})].$$

$$(\delta^2 E)/(\delta(j(c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 + (\delta^2 E)/(\delta x)^2 + (\delta^2 E)/(\delta y)^2 + (\delta^2 E)/(\delta z)^2 = 0 .$$

Because $(j)^2 = -1$**, I modify the equation.**

$$(\delta^2 E)/(\delta((c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 = (\delta^2 E)/(\delta x)^2 + (\delta^2 E)/(\delta y)^2 + (\delta^2 E)/(\delta z)^2 .$$

$$B = B_{max} \sin[2\Pi\lambda^{-1}(x + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + B_{max} \sin[2\Pi\lambda^{-1}(y + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + B_{max} \sin[2\Pi\lambda^{-1}(z + j(c + nh\lambda^{-1}M^{-1})t/3^{1/2})].$$

$$(\delta^2 B)/(\delta(j(c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 + (\delta^2 B)/(\delta x)^2 + (\delta^2 B)/(\delta y)^2 + (\delta^2 B)/(\delta z)^2 = 0 .$$

$$(\delta^2 B)/(\delta((c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 = (\delta^2 B)/(\delta x)^2 + (\delta^2 B)/(\delta y)^2 + (\delta^2 B)/(\delta z)^2 .$$

THE KLEIN-GORDON EQUATION AND QUANTUM MECHANICS

A generalised wave equation was introduced for a four-dimensional universe, as below.

$\psi = \sin[2\Pi\lambda^{-1} K \{ L\ ct - x \}]$.

The Klein-Gordon Equation is

$$-(\delta^2\psi)/(c^2(\delta t)^2) + \blacktriangledown^2\psi = -(\delta^2\psi)/(c^2(\delta t)^2) + (\delta^2\psi)/(\delta x)^2 + (\delta^2\psi)/(\delta y)^2 + (\delta^2\psi)/(\delta z)^2 = M^2c^2 4\Pi^2 h^{-2}\psi.$$

To produce the result in the previous equation, I find
$K^2(L^2 - 1) = M^2c^2\lambda^2h^{-2}$.
A solution is as follows.
$\psi = \sin [(2\Pi\lambda^{-1}) (1 + h^2M^{-2}c^{-2}\lambda^{-2})^{-1/2}\{(1 + h^2M^{-2}c^{-2}\lambda^{-2})^{1/2} ct - x \}]$.
The Klein-Gordon Equation is for a four-dimensional universe, but, therefore, incorrect because this is a peculiar three-dimensional universe. Therefore, after considering my earlier equations from this paper, I suggest a new equation with K and L to be determined.

$$\psi = \sin [2\Pi\lambda^{-1}K (x + jL(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + \sin [2\Pi\lambda^{-1}K (y + jL(c + nh\lambda^{-1}M^{-1})t/3^{1/2})] + \sin [2\Pi\lambda^{-1}K (z + jL(c + nh\lambda^{-1}M^{-1})t/3^{1/2})].$$

I propose that the Klein-Gordon Equation should be modified to the following.

$$- (\delta^2\psi)/ (\delta((c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 + \nabla^2\psi$$
$$= - (\delta^2\psi)/(\delta((c + nh\lambda^{-1}M^{-1})t/3^{1/2}))^2 + (\delta^2\psi)/(\delta x)^2 + (\delta^2\psi)/(\delta y)^2 + (\delta^2\psi)/(\delta z)^2$$
$$= M^2c^2 4\Pi^2h^{-2}\psi .$$

The best solutions that I can create for this equation are as follows.

$$\psi = \sin [(2\Pi hM_1c_1)\{x_1 + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] + \sin [(2\Pi hM_1c_1)\{y_1 + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] + \sin [(2\Pi hM_1c_1)\{z_1 + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] .$$

This can be expressed in polar co-ordinates.

$$\psi = \sin [(2\Pi hM_1c_1)\{(r_1\sin\Omega_1 \sin\theta_1) + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] + \sin [(2\Pi hM_1c_1)\{(r_1\cos\Omega_1 \sin\theta_1) + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] + \sin [(2\Pi hM_1c_1)\{(r_1\cos\theta_1) + ((c_1 + n_1h\lambda_1^{-1}M_1^{-1})t_1/3^{1/2})\}] .$$

Coulomb and gravitational aspects can be introduced into these equations due to equations for $(\delta t_1)^2$, $(\delta r_1)^2$, and E_{12}^{-1}.
$(\delta t_1)^2 = (\delta t)^2[1 - Q_1Q_2(4\pi\varepsilon_{12})^{-1}M_1^{-1}r_1r_{12}^{-2}c_1^{-2}]^{-2} = (\delta t)^2\gamma^{-2}$.
$(\delta r_1)^2 = (\delta r)^2[1 - Q_1Q_2(4\pi\varepsilon_{12})^{-1}M_1^{-1}r_1r_{12}^{-2}c_1^{-2}]^2 = (\delta r)^2\gamma^2$.
$E_{12}^{-1} = (\varepsilon_o^{-1} - 4\pi GM_1M_2Q_1^{-1}Q_2^{-1})$.

RODGERS'S KINETIC MOLECULAR THEORY OF GASES

Rodgers's Theory of Gases is a development from the Kinetic Molecular Theory for Gases, and requires most of the latter assumptions. In Rodgers's Theory of Gases:

- **The interactions between molecules are NOT negligible.**
- **Relativistic effects are NOT negligible.**
- **Quantum-mechanical effects are NOT negligible.**
- **The total volume of the individual gas molecules added up is NOT negligible compared to the volume of the container.**

Where pressure equals P, volume equals V, and v equals velocity,

the Kinetic Molecular Theory of Gases gives that
$3PV / N_m = M(v_{rms})^2$.

I decide to use V_{Ti} for total volume, and V_{Mi} for the volume of a molecule of mass M_i.
I introduce Kinetic Energy as K.
For my system with variable velocity-of-light,
$K/c_{io} = M_ic_i - M_{io}c_{io}$.
But,
$(3/2)P_i[V_{Ti} - \sum V_{Mi}]/ (c_iN_{Mi}) = (\text{total } K)/N_m = KE.$
Energy density of the gas system is $w_i = 3P_i[V_{Ti} - \sum V_{Mi}]$.
The mathematics pertaining to a Carnot engine is as follows:
$Q = \int \delta Q = \int \delta U + \int \delta W = \int w_i\, \delta V + \int p_i\, \delta V = (4/3)\, \{w_b\, [V_{Tb} - \sum V_{Mb}] - w_a\, [V_{Ta} - \sum V_{Ma}]\}.$
Mathematics, from this theory of gases, suggests the following equation.

$$\delta\,[(\sum(\delta\,(M_i\underline{s}_i))).(\sum(\delta\,(M_i\underline{s}_i)))] = \delta\,[[\sum(\delta\,(M_is_i))]^2] =$$
$$\delta\,[[\sum\delta\,\{M_i\,x_i + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$+\,\delta\,[[\sum\delta\,\{M_i\,y_i + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$+\,\delta\,[[\sum\delta\,\{M_i\,z_i + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$= 0\ .$$

This can be expressed in polar co-ordinates.

$$\delta\,[(\sum(\delta\,(M_i\underline{s}_i))).(\sum(\delta\,(M_i\underline{s}_i)))] = \delta\,[[\sum(\delta\,(M_is_i))]^2] =$$
$$\delta\,[[\sum\delta\,\{M_i\,(r_i\sin\Omega_i\,\sin\theta_i) + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$+\,\delta\,[[\sum\delta\,\{M_i\,(r_i\cos\Omega_i\,\sin\theta_i) + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$+\,\delta\,[[\sum\delta\,\{M_i\,(r_i\cos\theta_i) + j\,(n_ih\lambda_i^{-1} + 3P_i[V_{Ti} - \sum V_{Mi}]/(2c_iN_{Mi}))(t_i)/3^{1/2}\}]^2]$$
$$= 0\ .$$

$(\delta t_i)^2 = (\delta t)^2[1 - Q_iQ_j(4\pi\varepsilon_{ij})^{-1}M_i^{-1}r_ir_{ij}^{-2}c_i^{-2}]^{-2} = (\delta t)^2\gamma_i^{-2}.$
$(\delta r_i)^2 = (\delta r)^2[1 - Q_iQ_j(4\pi\varepsilon_{ij})^{-1}M_i^{-1}r_ir_{ij}^{-2}c_i^{-2}]^2 = (\delta r)^2\gamma_i^2.$
$\varepsilon_{ij}^{-1} = (\varepsilon_o^{-1} - 4\pi GM_iM_jQ_i^{-1}Q_j^{-1}).$

The conservation equations are very significant in physics.

REVERSIBILITY CONSERVATION EQUATION

$\delta[(\sum(M_as_a)).(\sum(M_as_a))] = 0.$
$\delta[(\sum(\delta(M_as_a)/((1/\delta x_a)+(1/\delta(ic_at_a))).(\sum(\delta(M_as_a)/((1/\delta x_a)+(1/\delta(ic_at_a)))] = 0.$
$\delta[(\sum(\delta^2(M_as_a)/((1/\delta x_a)^2+(1/\delta(ic_at_a))^2)).(\sum(\delta^2(M_as_a)/((1/\delta x_a)^2+(1/\delta(ic_at_a))^2)] = 0.$
As I scribbled out my conservation equations, I realised that there is a family of equations with the general equation as below.

$$\delta[(\sum(\delta^z(M_as_a)/((1/\delta x_a)^z+(1/\delta(ic_at_a))^z)).(\sum(\delta^z(M_as_a)/((1/\delta x_a)^z+(1/\delta(ic_at_a))^z)] = 0.$$

This is more fully typed as the following.

$$\delta[(\sum(\delta^z(M_as_a)/[-1/(\delta(c_at_a\alpha_a\phi_a\xi_a))^z + 1/(\delta(r_a\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^z + 1/(\delta(\theta_a))^zr_a^z].\ (\sum(\delta^z(M_as_a)/[-1/(\delta(c_at_a\alpha_a\phi_a\xi_a))^z + 1/(\delta(r_a\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^z + 1/(\delta(\theta_a))^zr_a^z]$$
$$= 0.$$

$s = x_1e_1 + x_2e_2 + x_3e_3 + icte_4$ so that $s.s = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2$

This gives the same answer for t as for (-t). That means that events are reversible with time. Similarly for the following possible equations.

$s = x_1e_1 + x_2e_2 + x_3e_3 + icte_4 + i\lambda e_5$ so that $s.s = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct)^2 - (\lambda)^2$

$s = x_1e_1 + x_2e_2 + x_3e_3 + i(ct + \lambda)e_4$ so that $s.s = (x_1)^2 + (x_2)^2 + (x_3)^2 - (ct + \lambda)^2$.

Note that $\lambda = h/mv = ht/mx$.

In 2013, a televised physics program about Time made it obvious, to me, that a major error exists in current theoretical physics. Albert Einstein's 'Special Relativity' and his 'General Relativity', and my 'Beyond Albert Einstein's Relativity: UFT Physics' all predict reversibility of events with time in this universe, but this prediction is erroneous. In our real universe, if we drop a drinking-glass onto a tiled floor, the glass shatters so pieces scatter around. Most of us agree that it is impossible for the glass to re-assemble into its original form. Billions of such events provide evidence that events in our universe are not reversible with time. Theoretical physics needs to predict irreversibility of events with time.

IRREVERSIBILITY CONSERVATION EQUATION

$$(M\underline{s}).(M\underline{s}) = M^2[(x_1 + ict/3^{1/2})^2 + (x_2 + ict/3^{1/2})^2 + (x_3 + ict/3^{1/2})^2]$$

$$= M^2[(x_1)^2 + (x_2)^2 + (x_3)^2 + 2(x_1+x_2+x_3)ict/3^{1/2} - c^2t^2]$$

$$= M^2[(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2$$
$$+(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2$$
$$+(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})^2].$$

This gives different answers for t and for (-t). That means that events are irreversible with time. The UNIVERSAL CONSERVATION EQUATION FOR IRREVERSIBLE EVENTS WITH TIME will be different from the previous UNIVERSAL CONSERVATION EQUATION.

To simplify the equation further, I re-write it not as mass, but as density by volume. This equation is apt for velocity-of-light that is constant, as Albert Einstein believed, or variable as I believe. Further, this equation is apt whether events are reversible, as Albert Einstein believed, or irreversible, as I believe, with Time.

Note that Z equals any whole number from negative infinity to positive infinity. Density by Volume equals Mass. Everything existing in this universe, including photons, sub-atomic particles, massive suns, and humans, consists of wave-particles of the same formula, and is a manifestation of gravitational-electromagnetic waves commonly called light. In theoretical physics, unification of fields has occurred, so this unification is in everything, including humans, as we are part of this psychic universe where all universal particles interact as do the molecules aligning to form a crystal. … Peter Donald Rodgers 2014

Since I first saw the Klein-Gordon Equation, I have been very impressed by it. This equation is a very significant, so I improve the Klein-Gordon Equation in this paper.

ADVANCEMENTS FROM KLEIN-GORDON EQUATION

The Klein-Gordon Equation is

$$[(\sum(\delta^2/\delta x_j^{\,2}))-(\delta^2/c^2(\delta t)^{\,2})-M^2c^2h^{-2}]\psi = 0,$$

where $\psi = \sin(x - ct)$.

But, from the Klein-Gordon Equation, I created

$$\psi = \sin(x - ct - \lambda))$$ **where** $\lambda = h/mv$, **and**

my Klein-Gordon-Rodgers-Reversibility Equation

$$[(\sum(\delta^2/\delta x_j^{\,2})) - (\delta^2/c^2(\delta t)^{\,2}) - (\delta^2/(\delta\lambda)^{\,2})]\psi = 0.$$

But I propose changes to the Schwarzschild's metric. Firstly, I suggest these are changes to be included.

$$\alpha_a^{\,2} = (1 - (GM_b/r_{ab}) + (Q_aQ_b/4\pi\varepsilon_oM_ar_{ab}))^2;$$

$$\phi_a^{\,2} = (1 - (3P_aV_aM_a^{-1}c_a^{-2}))^2;$$

$$\xi_a^{\,2} = (1 - (\lambda_a/c_at_a))^2 = (1 - (h/(m_av_a\, c_at_a))^2 .$$

Including these, I create the Schwarzschild-Rodgers-Reversibility metric:

$$(\delta(s_a))^2 = -(\delta(c_at_a)\alpha_a\phi_a\xi_a)^2 + (\delta(r_a)\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})^2 + (\delta(\theta_a)r_a)^2.$$

The Schwarzschild-Rodgers Irreversibility metric is more complicated:

$$\begin{aligned}(\delta(s_a))^2 = [\,[\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2 \\ + [\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2 \\ + [\delta\,(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})\,]^2\,].\end{aligned}$$

I create my Klein-Gordon-Rodgers-Complex-Reversibility Equation.

$\psi =$ $\sin(-c_at_a\alpha_a\phi_a\xi_a + r_a\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1} + \theta_ar_a)$ **goes into the following.**

$$[-\delta^2/(\delta(c_at_a)\alpha_a\phi_a\xi_a)^2 + \delta^2/(\delta(r_a)\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})^2 + \delta^2/(\delta(\theta_a))^2r_a^{\,2}\,]\psi = 0.$$

A major problem is that the equations above, like Albert Einstein's relativity equations, are for situations where REVERSIBILITY of events with time exists. Reversibility never seems to exist. Like most people, I believe that IRREVERSIBILITY of events with time is what actually exists. Further, the Schwarzschild's metric reveals that polar coordinates are most appropriate to use.

$$\begin{aligned}\psi = [\,(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_1 \\ +(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_2 \\ +(\sin(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))e_3\quad].\end{aligned}$$

But, because it does not contain vectors, I suggest that ψ^2 **is easier to use than** ψ.

$$\psi^2 = [(\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})) + (\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})) + (\sin^2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))].$$

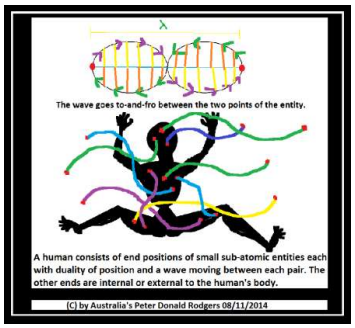
But $[\sin^2(x) = (½)(1-\cos(2x))]$ simplifies ψ^2 mathematics.

RODGERS COMPLEX IRREVERSIBILITY EQUATION:

$$\psi^2 = [((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))) + ((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2})) + ((1/2)(1-\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))].$$

$$[\delta^2/(\delta(r_a\sin\gamma\sin\eta(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2 + \delta^2/(\delta(r_a\sin\gamma\cos\eta(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2 + \delta^2/(\delta(r_a\cos\gamma(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1}))^2 + \delta^2/(\delta(c_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}))^2](\psi^2)$$

$$= 2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) + 2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) + 2\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) - (1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) - (1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) - (1/6)\cos(2(r_a(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma + ic_at_a(\alpha_a\phi_a\xi_a)3^{-1/2}) = (7/3)\psi^2 - (7/2).$$



ENTANGLEMENT EXISTS

The macroscopic formula seems to be Ms while the microscopic formula seems to be sin(s). The Klein-Gordon Equation seems far from correct because of the vectors

that are ignored in its formulation, and because the Klein-Gordon Equation is for a universe of reversible events with time, while the universe consists of irreversible

events with time. I attempted to find the solution by thinking about the limit of (sinD)/D = 1 as D goes to zero. I could not find a solution for A until I suddenly
tried the Entanglement concept. I discovered that

$$\text{Limit } \sin((M_Bs_B - M_As_A)^2)/((M_Bs_B - M_As_A)^2) = 1,$$

as $((M_Bs_B - M_As_A)^2)$ **goes to zero.**

Consequently, the microscopic formula should be using

$$\sin((M_Bs_B - M_As_A)^2).$$

And the macroscopic formula should be using

$$((M_Bs_B - M_As_A)^2).$$

In simple coordinates, approximately,

$$(M_Bs_B - M_As_A)^2$$

$$= [(M_Bx_{B1} + M_Bict/3^{1/2} - M_Ax_{A1} - M_Aict/3^{1/2})^2$$
$$+ (M_Bx_{B2} + M_Bict/3^{1/2} - M_Ax_{A2} - M_Aict/3^{1/2})^2$$
$$+ (M_Bx_{B3} + M_Bict/3^{1/2} - M_Ax_{A3} - M_Aict/3^{1/2})^2]$$

In polar coordinates,

$$(M_Bs_B - M_As_A)^2$$

$$= [(M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\sin\gamma\sin\eta + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\sin\gamma\sin\eta + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2$$
$$+ (M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\sin\gamma\cos\eta + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\sin\gamma\cos\eta + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2$$
$$+ (M_B\, r_B(\alpha_B^{-1}\phi_B^{-1}\xi_B^{-1})\cos\gamma + M_Bic_Bt_B(\alpha_B\phi_B\xi_B)3^{-1/2}$$
$$- M_Ar_A(\alpha_A^{-1}\phi_A^{-1}\xi_A^{-1})\cos\gamma + M_Aic_At_A(\alpha_A\phi_A\xi_A)3^{-1/2})^2]$$

RELATIVISTIC VOLUME

When I was sixteen, I wanted to know what the equation for relativistic volume is. Unfortunately, I blamed my hardworking, intelligent teacher of ignorance when he did not know the answer. The truth is that it is a very difficult question to answer. During my life, I have struggled with, and scribbled out ideas and answers for this problem several times. In the past, I have considered only the situation of reversible events with time mathematics. On this occasion, I also consider the situation of irreversible events with time mathematics. The mathematics that I now give for reversibility of events with time is equivalent to what I scribbled out about forty years ago.

REVERSIBILITY-OF-EVENTS-WITH-TIME VOLUME EQUATION

In Calculus, the volume of a region D in R3 is given by a triple integral of the constant function f(x,y,z) = 1 and, for the 4-dimensional situation of Special Relativity, is usually written as

$$\int\int\int (1)\delta x\delta y\delta z \text{ . Volume} = V = xyz.$$

IRREVERSIBILITY-OF-EVENTS-WITH-TIME VOLUME EQUATION

For the 3-dimensional situation of my irreversibility geometry, the volume can be written as

$$\int\int\int (1)\delta(x+3^{-1/2}ict)\ \delta(y+3^{-1/2}ict)\ \delta(z+3^{-1/2}ict) \text{ .}$$

More thoroughly in polar coordinates, the volume is:

$$\int\int\int (1)\ (\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\sin\eta+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a))$$
$$(\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\sin\gamma\cos\eta+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a))$$

$$(\delta(r_a)(\alpha_a^{-1}\phi_a^{-1}\xi_a^{-1})\cos\gamma+3^{-1/2}i\delta(ct)(\alpha_a\phi_a\xi_a)) .$$

If irreversibility of events with time, this could provide cosmologists with a useful equation for deciding whether expansion or shrinking of the universe is accelerating.

REALIZATIONS IN ZERO RELATIVITY:

1. **Events are irreversible in time.**
2. **Relativity's basic geometry is incorrect.**
3. **Velocity-of-light is variable, and not constant.**
4. **Special Relativity and General Relativity contain incorrect mathematics.**
5. **Maxwell's Equations need to be improved.**
6. **Fields in physics can be unified.**
7. **Black hole mathematics is incorrect.**
8. **No horizon exists around dense matter.**
9. **The conservation laws can be improved.**
10. **Einstein's most famous equation can be improved.**
11. **A wonderful harmony of equations exist in reality.**
12. **My unifying field theory gives the Navier-Stokes equation.**

My equations are the most thorough unification of mathematical physics concepts and formulae known to Theoretical Physics. I now list possible consequences.

EXPECTED ADVANCEMENTS DUE TO WHY NAVIER-STOKES EQUATION:

1. **more elaborate wave equations better than the Gordon-Klein equation**
2. **changes to thermodynamics**
3. **more accurate mathematics pertaining to a Carnot engine**
4. **a much more versatile and accurate law than the Stefan-Boltzmann Law**
5. **explanation about why Einstein's and Friedmann's equations are incorrect in some cases**
6. **better cosmological equations**
7. **mathematical explanation about why the event horizon does not exist**
8. **mathematical explanation about why the theorized black hole does not exist**
9. **changes to the Four laws of black hole mechanics**
10. **better equations to study the beginning of this universe**
11. **better equations to study the evolution of galaxies**
12. **an explanation about why dark matter seems to exist**

13. **a new equation for Blackbody Radiation**
14. **a new equation for Hawking Radiation from a black hole**
15. **a much more generalized equations than the NAVIER-STOKES EQUATIONS**
16. **mathematical evidence that ENTANGLEMENT exists**

NAVIER-STOKES EQUATION

The general UNIVERSAL CONSERVATION EQUATION FOR REVERSIBLE EVENTS WITH TIME gives the conservation of momentum and energy equations presently used by physicists. The Navier-Stokes Equation of Fluid Dynamics comes from the current conservation equations. Therefore, the Navier-Stokes Equation may be derived from the general UNIVERSAL CONSERVATION EQUATION. The NAVIER-STOKES EQUATION: the sum of the gravitational force, the pressure force, and the viscous force is equal to the mass by acceleration. When simplified for a similar situation, the general UNIVERSAL CONSERVATION EQUATION, whether the equation for reversible or the equation for irreversible events with time, leads to mathematics of the gravitational force, the pressure force, a wave force, a Coulomb force, and a mass by acceleration force. Some of these forces are added to be the viscous force. For further in-depth mathematical analysis of the fluid dynamical system, I can apply any member of the family of this general equation.

CONCLUSION

Over the course of eons, humans have advanced step by step. Here, I hope to have contributed a small piece toward our scientific goals; this small improvement vision which spans, by way of specific mathematics, across many areas which are not so distantly related as people have believed. The few equations offered here may yet aid in our more complete understanding of a proper unified field theory, a more full understanding of fluid dynamics, of geometry itself, of black holes and super-massive objects, of time, and of the conservation laws. Now, physicists might be better equipped to decide whether the volume of our universe is expanding or shrinking. My three major equations in this paper are these:

I expanded upon the famous Schwarzschild's Equation for the bending of a light-ray passing our Sun.
From that equation, and current conservation equations, I created UNIVERSAL CONSERVATION EQUATION FOR REVERSIBLE EVENTS WITH TIME. After that, I discussed the possibility of irreversible events with time due to my alternative equation. If correct, irreversibility means that the UNIVERSAL CONSERVATION EQUATION would be modified. The most major breakthrough in this paper is my mathematical explanation of how macroscopic and microscopic formulae come from ENTANGLEMENT. This mathematical analysis leads beyond physics into understanding of metaphysics, telepathy and Reiki therapy.

DEFINITIONS

$\sum$ = summation of

c = velocity-of-light in a vacuum
c_a = velocity-of-light at centre-of-mass of particle a relative to centre-of-mass of the entire system
c_{ao} = velocity-of-light at centre-of-mass of particle i_o relative to centre-of-mass of the entire system
E = energy of wave-particle
G = gravitational constant
h = Planck's constant
M = mass of wave-particle relative in observer it to the c-of-m of the whole system
M_a = mass of wave-particle a relative in observer it to the c-of-m of the whole system
M_{ao} = mass of wave-particle io relative in observer it to the c-of-m of the whole system
M_o = mass of wave-particle o relative in observer it to the c-of-m of the whole system
N = number of atoms
n_a = orbital of a
n_b = orbital of b
P = pressure
Q_a = charge on wave-particle a
Q_b = charge on wave-particle b
r_a = radial distance from the c-of-m of wave-particle a to c-of-m of the whole system
r_{ab} = radial distance from the c-of-m of wave-particle a to c-of-m of wave-particle b
r_{ao} = initial radial distance from the c-of-m of wave-particle a to c-of-m of the whole system
t_a = time relative to an observer at the c-of-m of the whole system
t_{ao} = initial time relative to an observer at the c-of-m of the whole system
v = velocity of wave-particle relative to an observer at the c-of-m of the whole system
V = volume
v_a = velocity of wave-particle a relative to in observer at the c-of-m of the whole system
v_{ao} = velocity of wave-particle a_o relative to an observer at the c-of-m of the whole system
V_{Ma} = volume of mass a
V_{Mao} = volume of mass a
v_{rms} = velocity of atoms relative to an observer at the c-of-m of the whole system
V_{Ta}= total volume
V_{Tao}= total volume
x_a = position in x-direction of a
x_b = position in x-direction of b
γ_a = simplificition of gravitational effects on a
γ_b = simplificition of gravitational effects on b
δ = change of
ε_0 = electrical permittivity in a vacuum
θ_a = angle moved in θ direction a
θ_b = angle moved in θ direction b
λ_a = wavelength of wave-particle a
λ_b = wavelength of wave-particle b
μ_0= magnetic permeability
Π = pi
Ω_a = angle moved in Ψ direction a
Ω_b = angle moved in Ψ direction b

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2. **'Einstein Wrong: UFT Physics'', 2013.**
3. **'Could Albert Einstein's Special Relativity Be Correct?', 15th June 2014, in Mind Magazine,**
4. **'Do Stephen Hawking's Black Holes Exist?', 13th July 2014, in Mind Magazine,**
5. **'No Hawking's Black Hole', 19th July 2014, in Mind Magazine,**
6. **'Relativity Black Hole Truth', 29th July 2014, in Mind Magazine.**
7. **'Navier-Stokes Physics', 2nd August 2014, in Mind Magazine.**
8. **'NAVIER-STOKES EQUATION', 4th August 2014, in Mind Magazine.**
9. **'WHY NAVIER-STOKES EQUATION', 7th August 2014**
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12.'ENTANGLEMENT EXISTS', 12th November 2014.

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ZERO RELATIVITY

© by Australia's Dr Peter Donald Rodgers 14 Dec 2014

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